



人体结构

原理与绘画教学

HUMAN ANATOMY FOR ARTISTS

肖玮春 著/绘

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Human body structure

Principles and painting teaching

By San Xiao Qingchun / Painted

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The anime human body is an interesting collection, and the characters in different anime works have different character characteristics. And when people draw characters, they often don't know how to use people. To create a character with distinctive characteristics. When learning about the human body, I can't find an entry point for learning.

This book disassembles the structure of the human body, simplifies the knowledge that needs to be mastered to learn the human body, and explains the more difficult structural principles in the human body through simple geometric combinations, reason. The book arranges the process of learning the human body to help everyone clarify the knowledge and abilities that need to be mastered at all stages. If you want to draw interesting anime characters, you need everyone to master them. Do a good job of the basic knowledge of the human body while persevere in practice. And painting practice needs to be loved by everyone sincerely, so that we can effectively practice. I hope everyone can be here. Find your own happiness on the way to painting.

This book is suitable for art students and teachers, practitioners of game animation companies, and game animation hand-painted enthusiasts to learn and use.

-
- ◆ Written / painted by Xiao Yichun
Responsible Editor Dong Xuenan
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推荐语

一切伟大的创造都以深入地了解自我为前提。古语常讲“画鬼最易”，无迹可寻的东西往往可以主观臆造，可是对于“人”的塑造永远是有迹可循的。想要借由“人物”的形象不受束缚地表达形而上的东西，首先掌握贴近本质的规律精熟于心。《人体结构原理与绘画教学》为我们提供了起步的基础，详细的、规律性的阐述，帮助我们构建理性的逻辑，指向的都是感性表达的升华与想象力的自由放飞。

——清华大学美术学博士、第十三届日本大分亚洲雕塑展一等奖作品雕塑家 孙鹏

艺术这东西，精通难，入门亦难。它太抽象了，何为好，何为劣，全在人心，并无标准答案，需要艺者不断地积累，综合素养越高，作品越深刻。当然，技术必须要过硬，才能不受自己手头功夫的约束，淋漓尽致地表达自我，也更能打动观者。

一部动漫作品，剧情的构架是骨骼，人物的形象是筋肉，动作和画风是血液，传达的思想是灵魂，相辅相成不可分割。虽然乍看之下与架上的纯艺术不尽相同，然而追本溯源，却是师出同门。画手与艺术家一样，都要具备能够充分表现所绘对象的扎实的基本功和优秀的审美情操。

欲入此门，首要任务就是了解人的结构，毕竟无论所绘的是神或是鬼，形象都是由人而来的。互联网时代使得更是对动漫感兴趣的人便于自学，但好的教学资源凤毛麟角，能将动漫与人体结构精确挂钩的教材更是少之又少。《人体结构原理与绘画教学》一书，讲解详尽，生动明确，可以看出作者有专业扎实的绘画基础，对人体结构有深入的研究并形成了自己独特的教学方式，即使零基础的读者也能看得懂。热爱动漫，希望学习与投身动漫行业的年轻人，得遇此书，何幸如之。

——中国艺术研究院硕士，中国美术馆、国家大剧院收藏艺术家 张小曼

艺用人体解剖是造型艺术专业的一门必修课，解剖知识对艺术学子来说如建造大厦的基石，而解剖理论书籍则是最为系统化的学习资料，我们熟知的《伯里曼艺用人体解剖》从20世纪70年代以来便一直被学画之人奉为经典。而此书《人体结构原理与绘画教学》更包含了经典的艺用人体解剖知识和时下流行的动漫人物创作两部分，由浅入深地为专业学生以及动漫爱好者讲解人体结构、空间和动态的系统知识。如果说解剖知识看上去是些“死”知识的话，那么唯有把它吃透，才能在创作中不受限制地自由表达，让笔下的人物真正“活”起来。

——清华大学美术学院雕塑系副教授、硕士生导师、金属材料实验室教学负责人、BMW—清华非遗研创基地导师
王轶男

肖邦泰的书籍配图以简约的线条和形状构成，能够清晰而明了地从不同角度展现人体的基本形体特征，直接而准确地传达出书籍所要表达的核心观点，从而使读者能从浅显易懂的教学方法中领悟到解剖学知识。

——知名图书作者兼译者 贵哥

前言

关于画画这件事，每个人都有自己的故事。

对于我来说，画画大概始于孩童时代。那时的我不好好念书，就喜欢在课本上画满密密麻麻的小人，试图让它们演绎各种荒诞的故事，长期乐此不疲。那时画画之于我是最简单的快乐。

就这样，我一直玩要到了高中才开始接触到专业的美术训练，天天和静物、石膏、人像模特打交道。但画画并没有让我的学业一帆风顺，由于偏科严重，高考两度落榜。后来通过调整和努力，终于在第三次高考后，幸运地被一所有内的重点大学录取。

因祸得福的是，几次失败的经历，冥冥之中增强了我画画的韧劲，获得了原始的能量和动力。我学会了调整自己对待绘画的态度，得到了迅速的成长。

大学的时光美好而又短暂，在这几年里，我接触到了很多有着不同绘画特质的朋友，开始看到绘画更多的可能性，逐渐对传统高考美术以外的新领域进行探索，度过了一段开心画画的日子。

当然，在探索期间也遇到了很多难题，比如透视、结构、人体、构图、设计、风格等。在这个过程中我开始有意识地整理绘画问题，有计划地归纳出解决问题的方法。一段时间后，再次看到整理的笔记，感受到自己在潜移默化中得以成长，知晓自己到底在绘画之路上经历了什么，收获了什么。

当我把这些整理的笔记拿出来分享时，得到了很多小伙伴的反馈，这才发现笔记可以帮助大家解决一些在绘画过程中遇到的问题。我也因此感到很开心，后续就顺理成章地走上绘画教育这条路，一晃过去了很多年。

从最开始的孩童绘画乐趣，到体味绘画路上的酸甜苦辣，以及之后的自我探索学习，这些就是我迄今为止在绘画这件事上的经历。

以后我会选择怎么样的路？哪个方向？还会画些什么？我自己也不是很清楚。但这些年这条路走下来，自己对于画画这件事情内心却是越来越笃定。

不知不觉，我教画画有十多年的时间了，在这期间遇到了来自小伙伴们提出的关于人体绘画的各种各样的问题。《人体结构原理与绘画教学》这本书是对这几年线上线下教学内容的整理，也是对我个人当前阶段的一个总结。希望本书能够给喜欢画画的朋友带来些许帮助。

由于笔者水平有限，疏漏和不足之处在所难免，恳请广大师生同人批评指正。

画画的春哥（肖玮春）

2021年7月

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Chapter One

Body FRAME

第一章

人体
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01

Familiar with and master drawing human body brackets

1. The structure of the human body is more complex, including bone pathways, muscles, etc. When many people first come into contact with the structure of the human body, they will be The complicated structural relationship of the body is stumped. This chapter divides the structure of the human body and makes some remarks on the main points of the human body. I hope it can help everyone learn more about the human body.

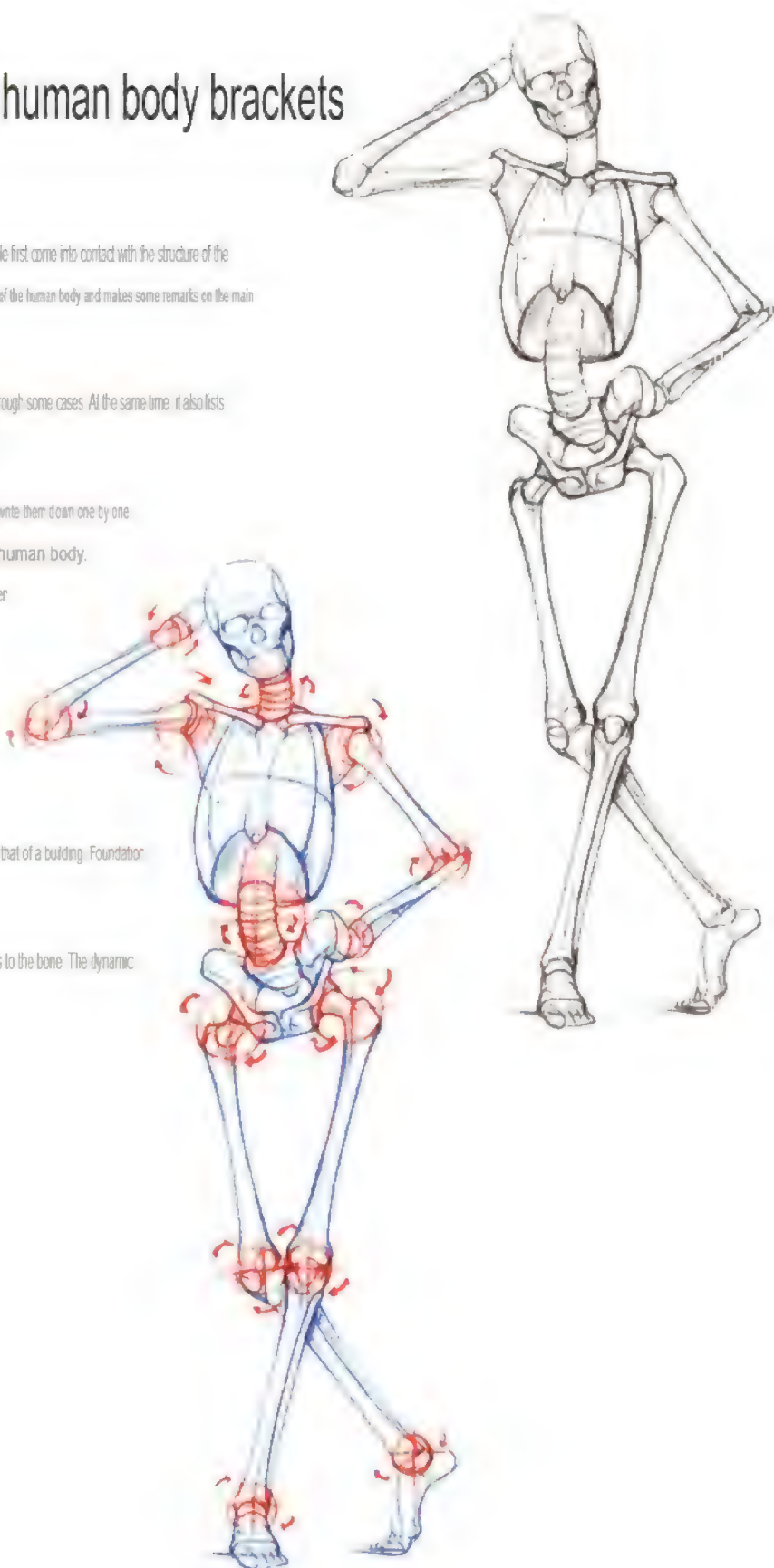
This chapter splits the scaffolds of the human body, and introduces the knowledge of human scaffolds through some cases. At the same time, it also lists Some familiar and mastered methods of drawing human scaffolds are given for your reference.

The human body has two hundred and six bones and six hundred and thirty-nine muscles, so you have to write them down one by one. It will be a very challenging thing. If we are learning about the structure of the human body, When there is no clear idea, then in the process of understanding the structure of the human body, it is often You will lose your way.

In the face of complex knowledge, we master the structure of the human body first. The step is to simplify the human body, the purpose of which is to facilitate us in the complex. Quickly find the main points you need to master in the structure of the human body.

First of all, let's talk about bone integrity. The status of bone cores in the human body is equivalent to that of a building. Foundation it is the foundation that supports the human body.

If we want to capture the state of movement of the human body, then the first thing we have to do is to the bone. The dynamic and static areas to which the First Association belongs are effectively divided.

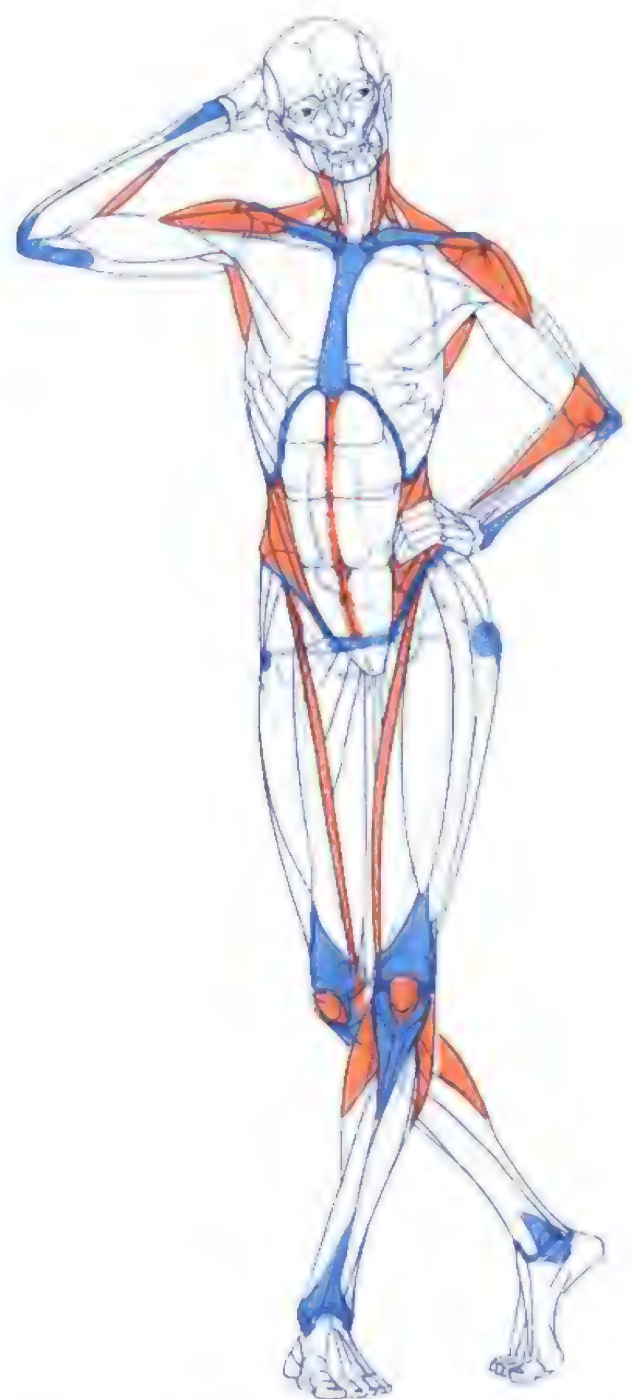
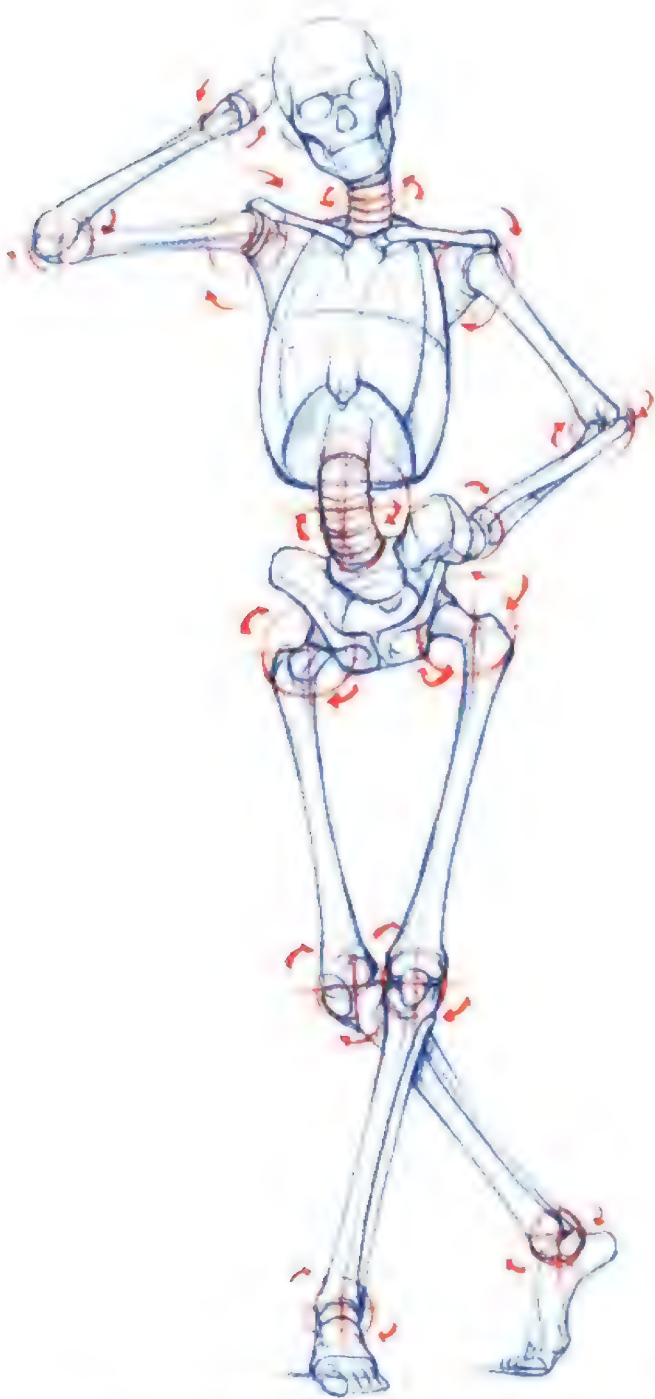


Dynamic area

An area with a large range of activities of a bone strip

Quiet area

An area with a small or two range of bone cheese activity



By dividing the dynamic and static areas in the human body,

We can better understand the relationship between muscle and bone association.

Muscles are mainly attached to the growth of the bone tract, and the movement of the bone tract. Movement also depends on the rate of the muscles.

When observing muscles, we can focus on movement.

Check the joints of the spine, spine, and limbs.

-Stop the muscles. Because when the human body is exercising, the muscles

Mean will be produced as the movement state of the joints changes.

change.

The purpose of our learning about the structure of the human body is not only. It is to understand the bones and muscles of the human body, and more in detail. With relevant knowledge to create a stationary one.

For the creative process of the character, we can simplify it.

There is a simple following two-step procedure:

(1) Build a solid human body bracket.

(2) Shape on this human body bracket.

When we observe the human body, we can see the movement of the human body. The state of movement of the body.

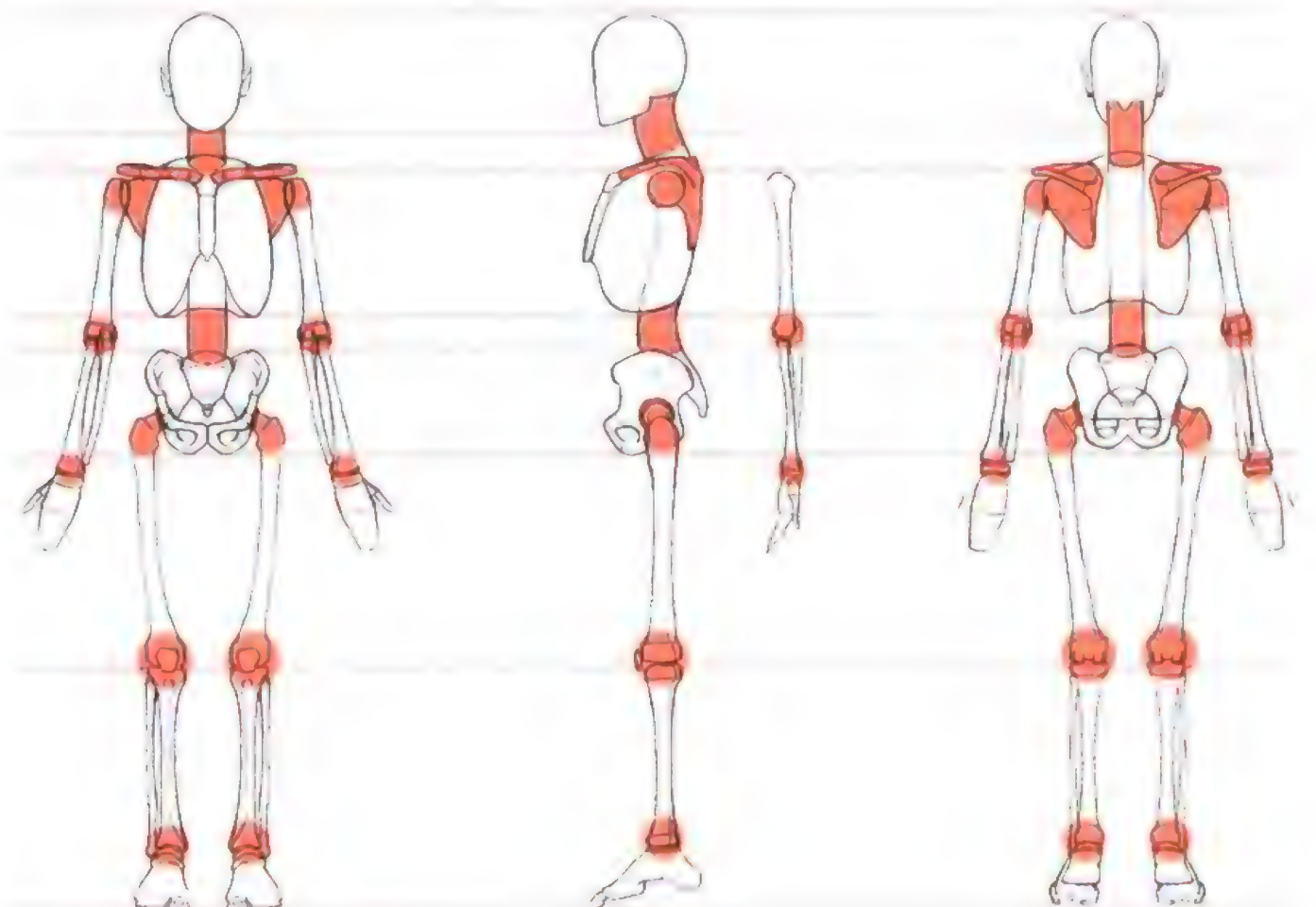


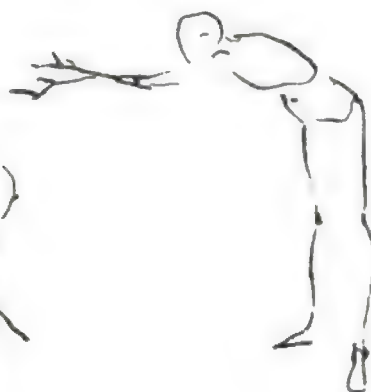
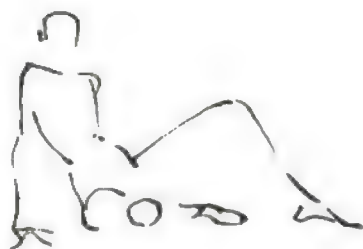
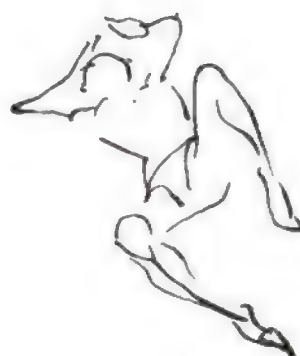
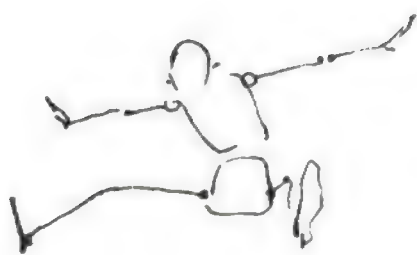
02

Joints of the human body

When drawing the three views of the bone path, you need to draw the horizontal reference line first, and then do not draw the front and back of the complete bone disc one by one.
[The surface and the back, so that it is easy to focus on all the bone structure seen.

When we recognize bone coins, we need to recognize the shape of bone coins from different angles. Because they are doing different actions.
At this time, the joints of the human body will undergo some changes, which not only requires us to master the different angles of each joint.
Shapes also require us to master their respective laws of movement.





When drawing the joints of the human body, we can move the corresponding joints on our body and feel the movement of these joints status.

When you first start to learn the knowledge of bone lattice structure, don't rush to understand the two hundred and six bones one by one. This can easily hit us. The enthusiasm of painting. When practicing drawing the three views of the bone road, we can do it appropriately. ~~Some~~ education of the enemy.

To simplify, you need to highlight the key points. What I want to emphasize here are a few large joints. These joints are mainly distributed in the spine. On the shoulders, straddle, and limbs, every bend or mid-extension of these parts will directly affect the movement state of the entire character.

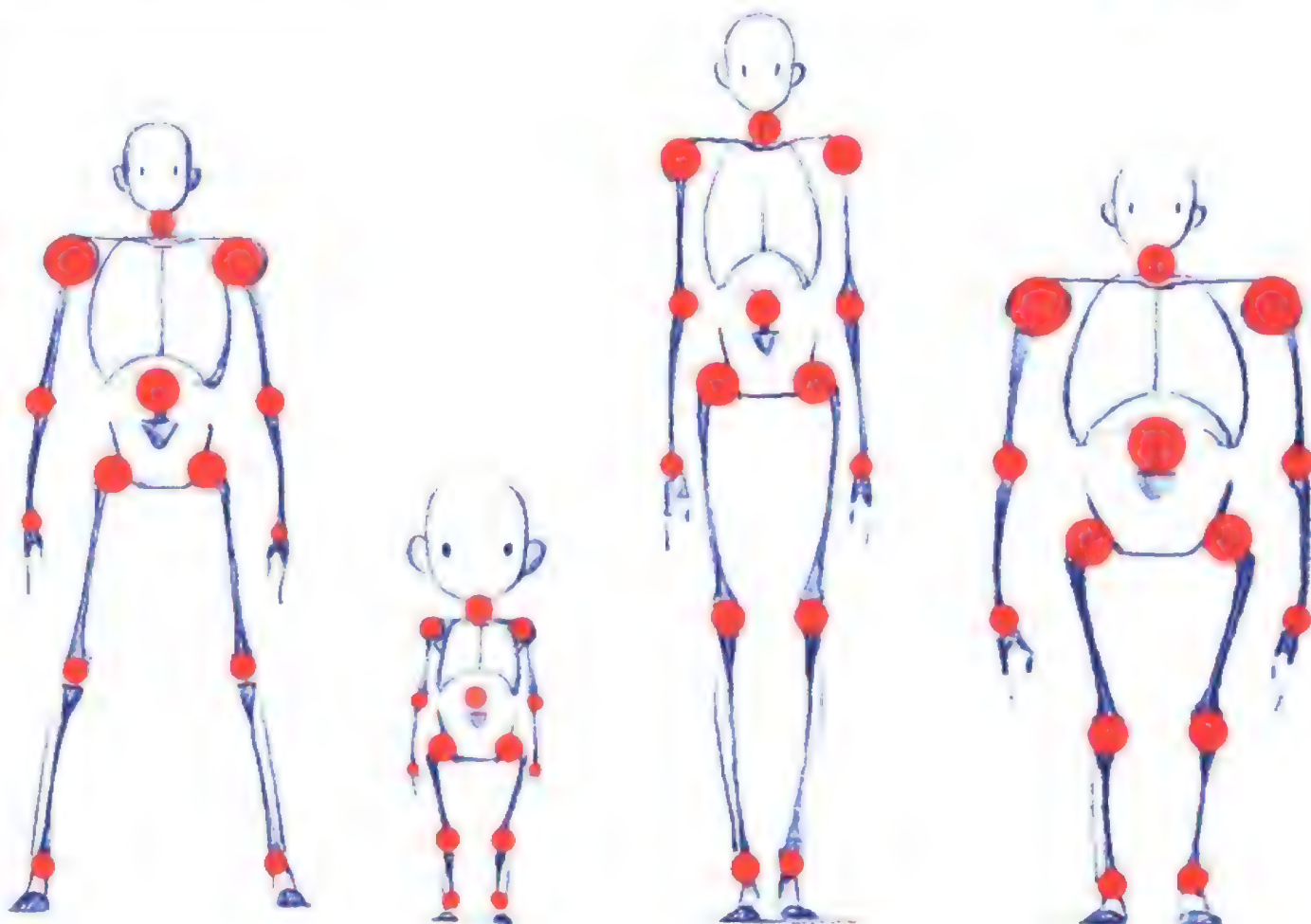
When creating characters, we can also make some capture designs on the joints appropriately. As long as we can master these. The spatial relationship and motor relationship of the joints, then the design of the capture will also give people a real and credible feeling.

If you want to create a good character, you can't rush to shape the local details of the character. Learn to start from the whole and design the role well. The overall proportional relationship is the key first step in creating a good character.

Make good use of each joint point of the human body, and by adjusting the size of the joint point and the distance between the joint points, we will be able to do it soon. Create a character with a unique shape.

In the creation process of anime characters, the proportion of characters is relatively large, and many such anime characters are normal creators. It is carefully designed on the basis of the body bracket.

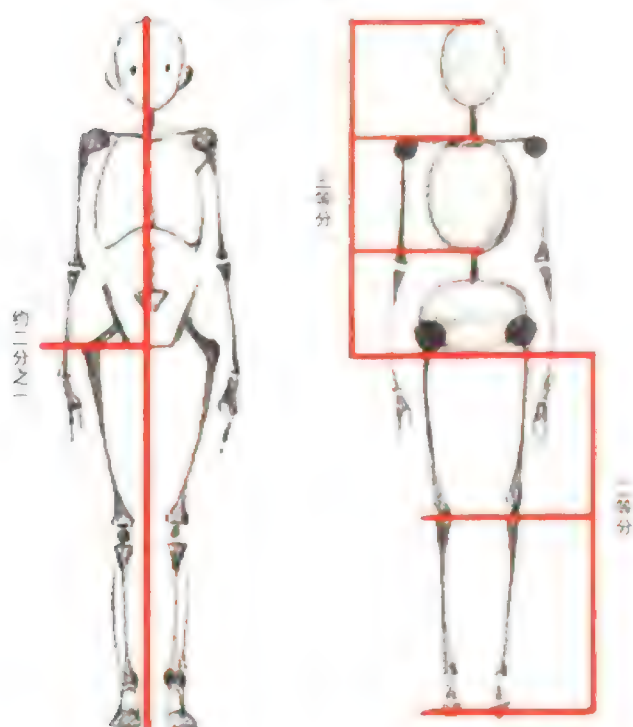
Take a good look at the different human body character designs, and its structure contains the essence points of people with different human body characteristics, so that we can. Create a good character on the basis of the human body bracket.



03

The relationship between changes in the proportion of the human body

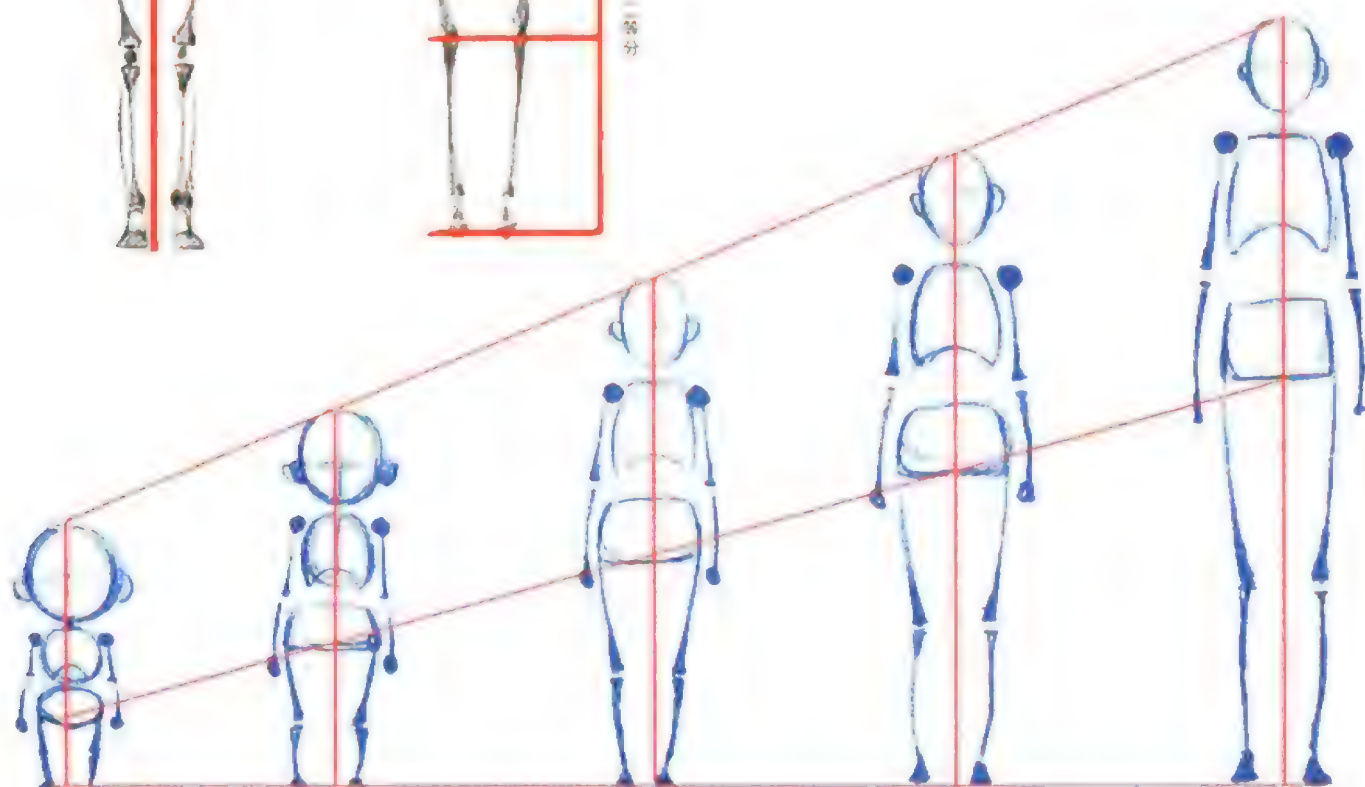
Simplified adult ratio

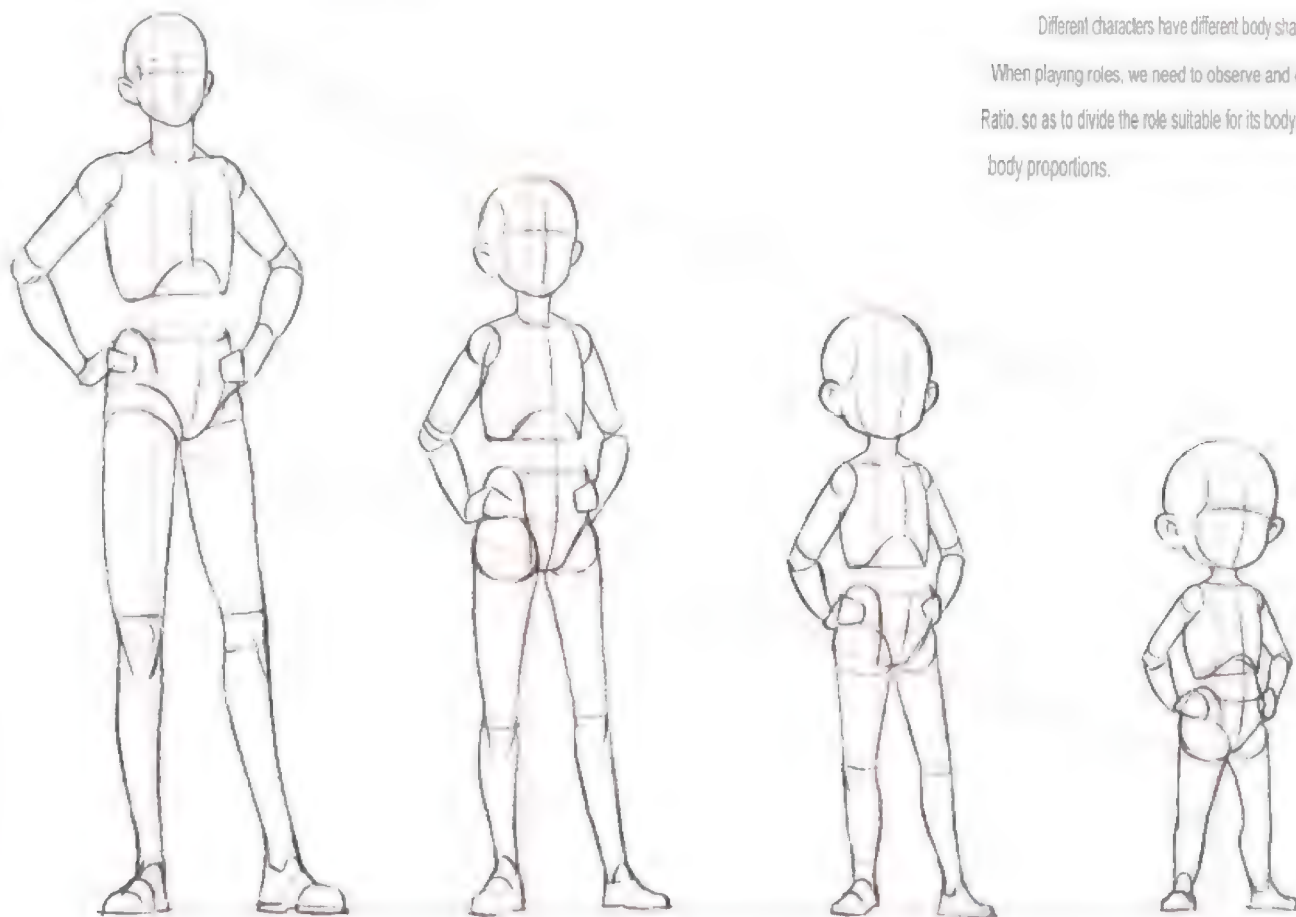


◆ Simple division of human body proportions

The adult's lower part is almost one-half of the height of the human body. When painting the upper body, divide the three parts of the head and neck, chest, waist, and hips equally. Draw the bottom half. When you are in the body, the two parts from the leg to the knee and the knee to the sole of the foot are divided into two parts.

The human body ratio of people of different ages is different, we can use the above human body ratio. The division method of the example adjusts the height of the line, so as to shape it with different proportions of the upper and lower bodies. Create human scaffolds of different body shapes.





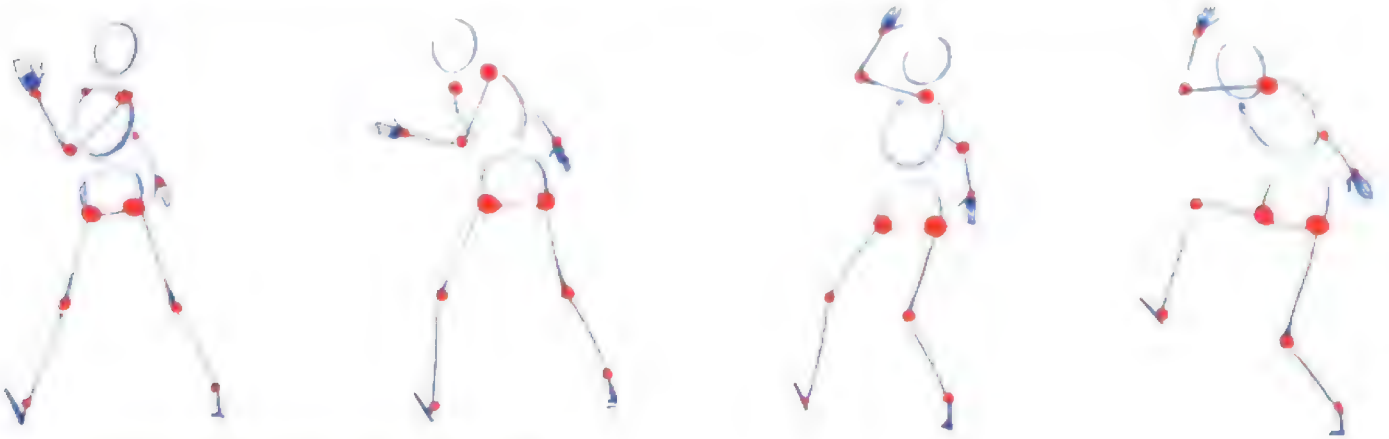
Different characters have different body shapes. In creation
When playing roles, we need to observe and correct more
Ratio, so as to divide the role suitable for its body type. Human
body proportions.



Clarify the proportion of the human body of people of different body
types. Features: choose the corresponding characterization method, it is
easy to shape. Create anime characters of different styles. Everyone is creating
When playing a role, don't just pay attention to the details of the role. Painting
the control of the proportion of the human body is also extremely important.

Affected by the spatial relationship, the movement of each joint point of the human body will cause different changes in the proportion of the human body.

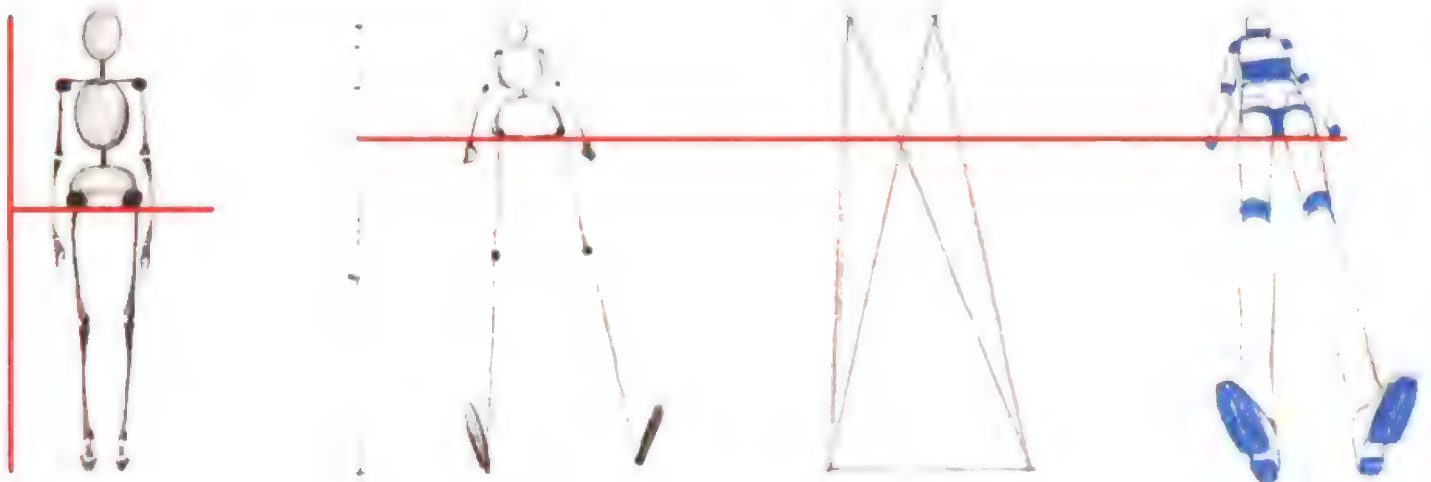
To understand the spatial relationship of the human body, we need to understand the spatial relationship of the human body in different poses.



The human body dynamics we usually observe often have perspective effects.

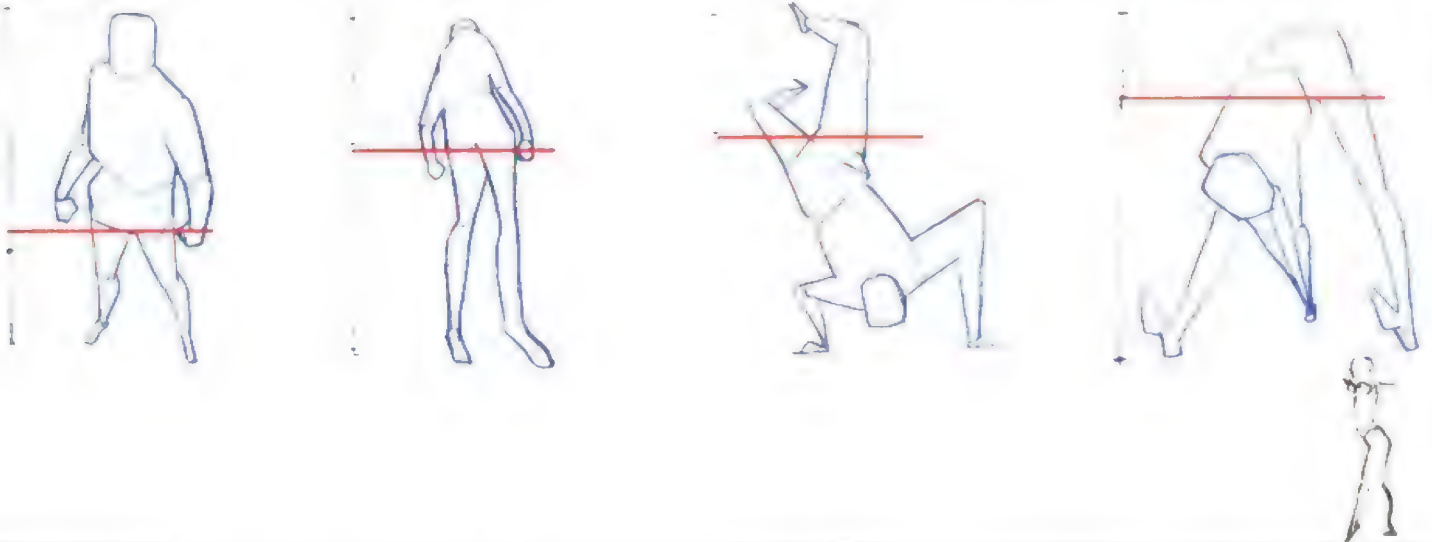
If we want to create a human body with a sense of space, we need to understand the spatial relationship of the human body in different poses.

Accordingly, then shape the cross-section of the joint point on each joint point.



Every human body of different poses will have different spatial relationship, and the spatial relationship of the human body will be different in different poses.

simple.



04

Drawing exercises for human scaffolds

01

Draw a vertical line to determine the person.
The position of the body gear. This step, although it is simple, the position of the gear department is the most that will directly affect the human body. The final body shape.



02

Draw a representative head above the line department.
Three of the face, chest, and abdomen. People have different body shapes and move. The state is different, the angle is not the same. The same, will make these three circles. The form changes. Drawing. When using a human stent, pay attention to. Deliberately control the size of these three circles. Small and between the circle and the circle distance.



03

Find the center of the human body. Line, centered on this line. Draw "work" on the chest and abdomen. Brackets for glyphs and "U" glyphs. This step can effectively shape Out of the torso of the human body.



04

Painted two in Kai Sheng and Cross section respectively. A sphere, pay attention to control this. The size of the four spheres. Kai Sheng. The upper sphere is better than the lower sphere. The body is smaller.



05

Take the four balls of Kai Sheng and Tenghe. The body is the starting point to draw the limbs. hand. It's just flush with the waist and knees. Just from the gear to the soles of the feet. Middle position. When painting four limbs. You must control your limbs at this time length.



06

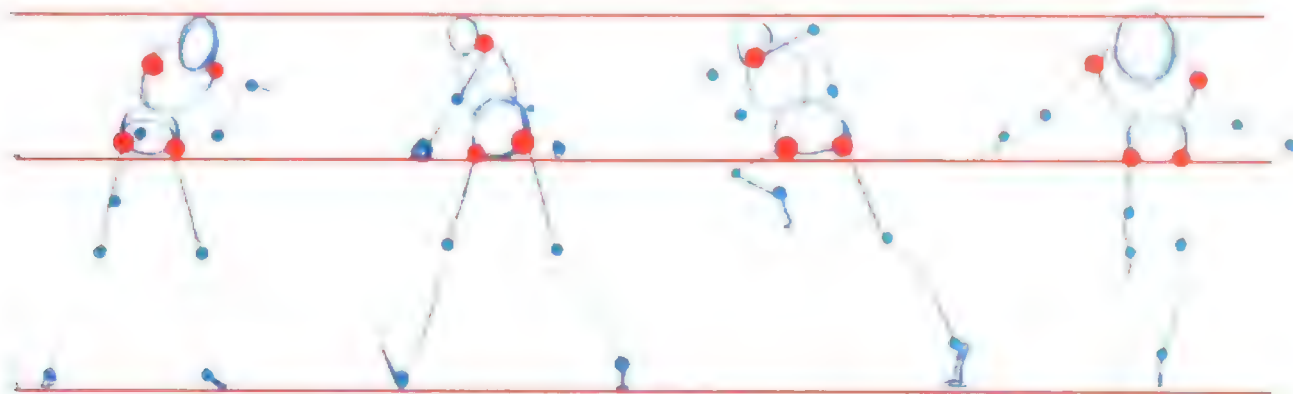
The entire human body bracket can be simple. The ground is divided into dryness and limbs. Determine the position of the file first when drawing. Set, then draw the drive dry and four Limbs, finally refined, human body branches. The frame is drawn.



In order to better draw the human body bracket, we can do some exercises.

◆ Use the same human body proportions to draw human body brackets in different states

- ① Draw the upper torso in different states in a reference line with the same proportion of the upper torso. Pay attention to controlling the size of the three circles and drawing the accurate relationship between the circles.
- ② Find the location of the four spheres of F. Shen and the cross segment. Try not to have the same direction of the spheres, adjust their size and the distance between them.
- ③ Draw the limbs separately, and pay attention to controlling the length of the limbs and the position of the joints of the limbs.

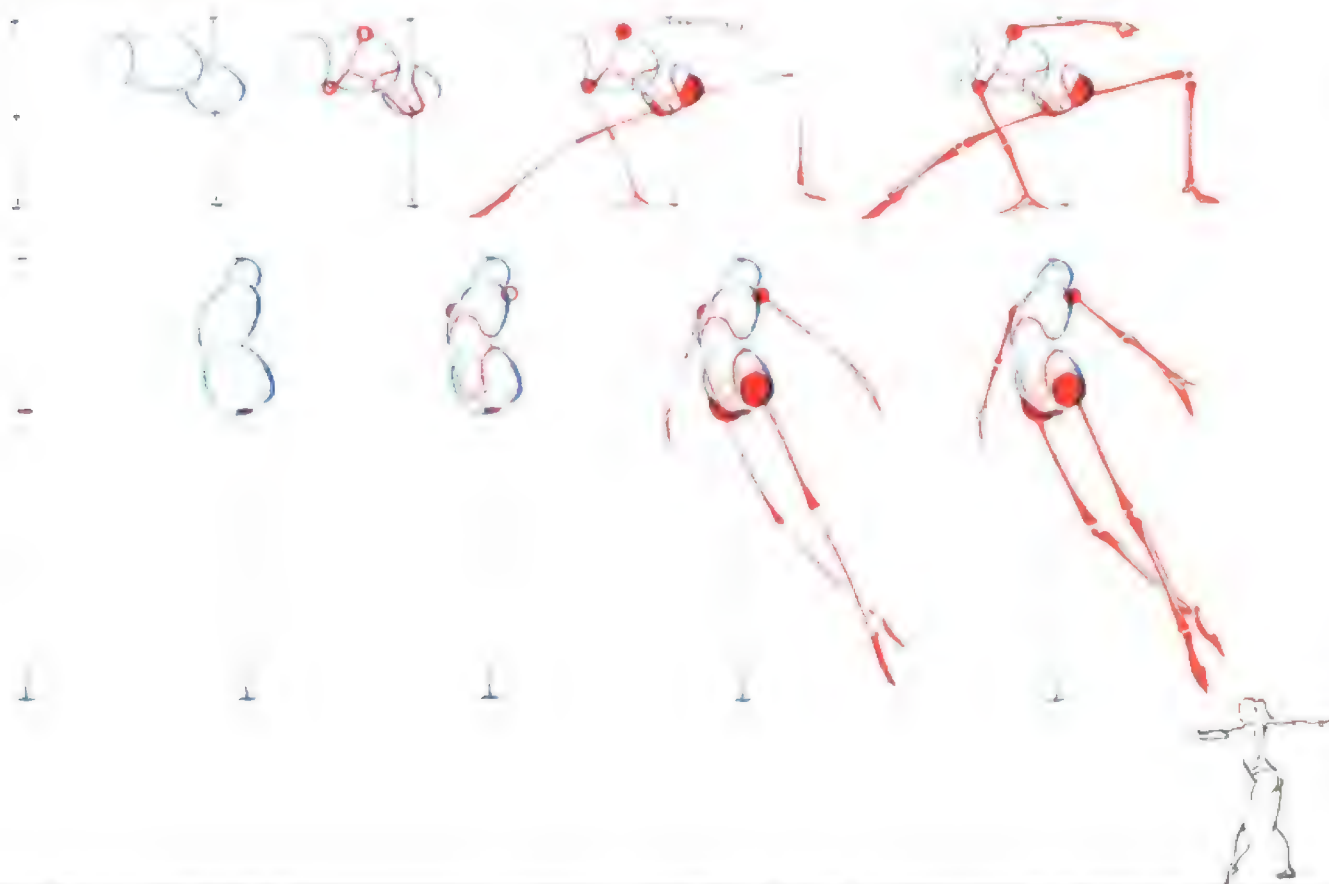


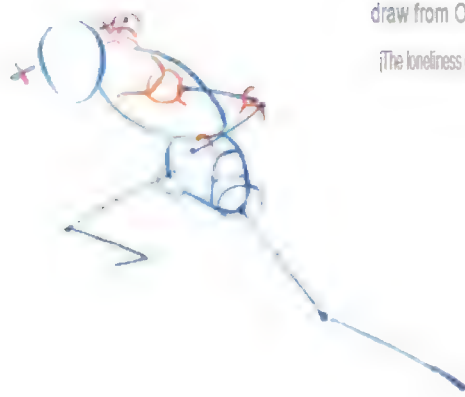
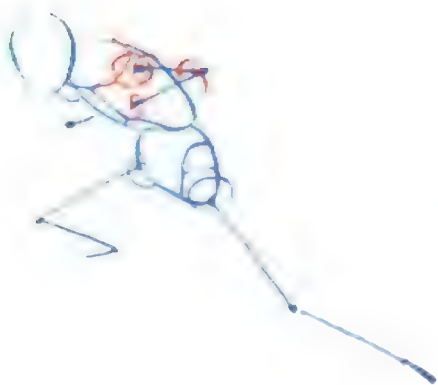
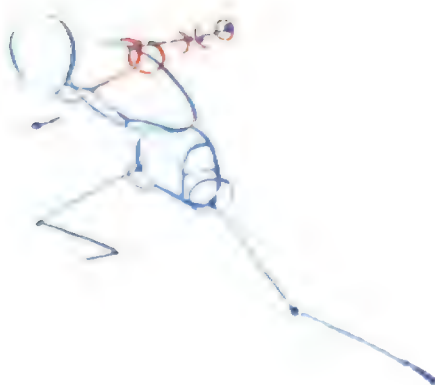
◆ Use different human body proportions to draw different dynamic human body brackets

① Draw vertical lines of different lengths and determine the position of the stop separately

② Draw three circles in a limited space: draw "Gong"-shaped and "U"-shaped brackets on the chest and spine, and then draw two spheres on the Kai Sheng and defense parts, respectively.

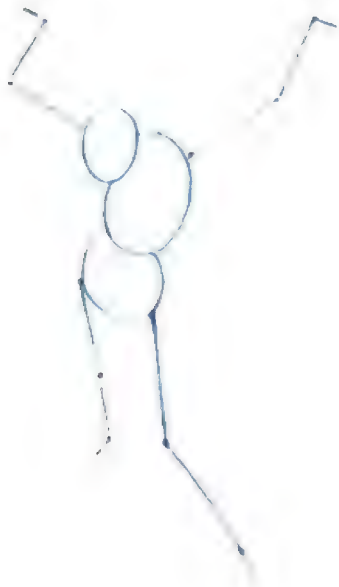
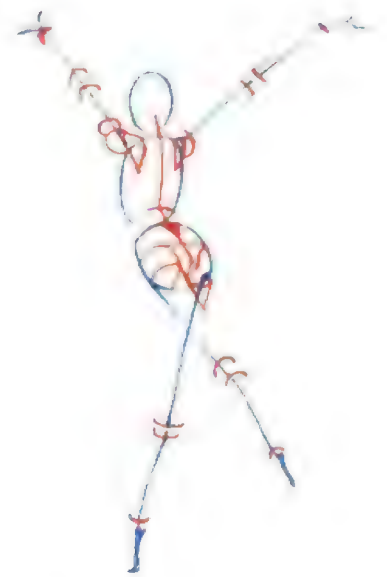
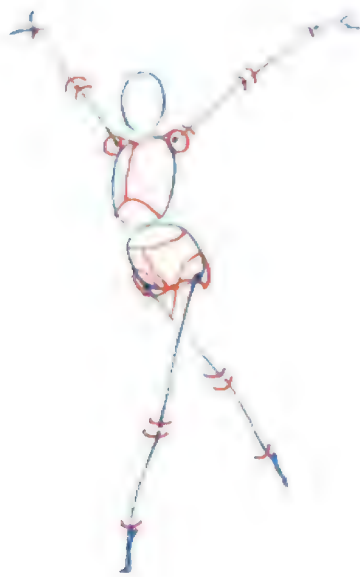
③ Arrange the dynamics of the limbs according to the state of the torso.



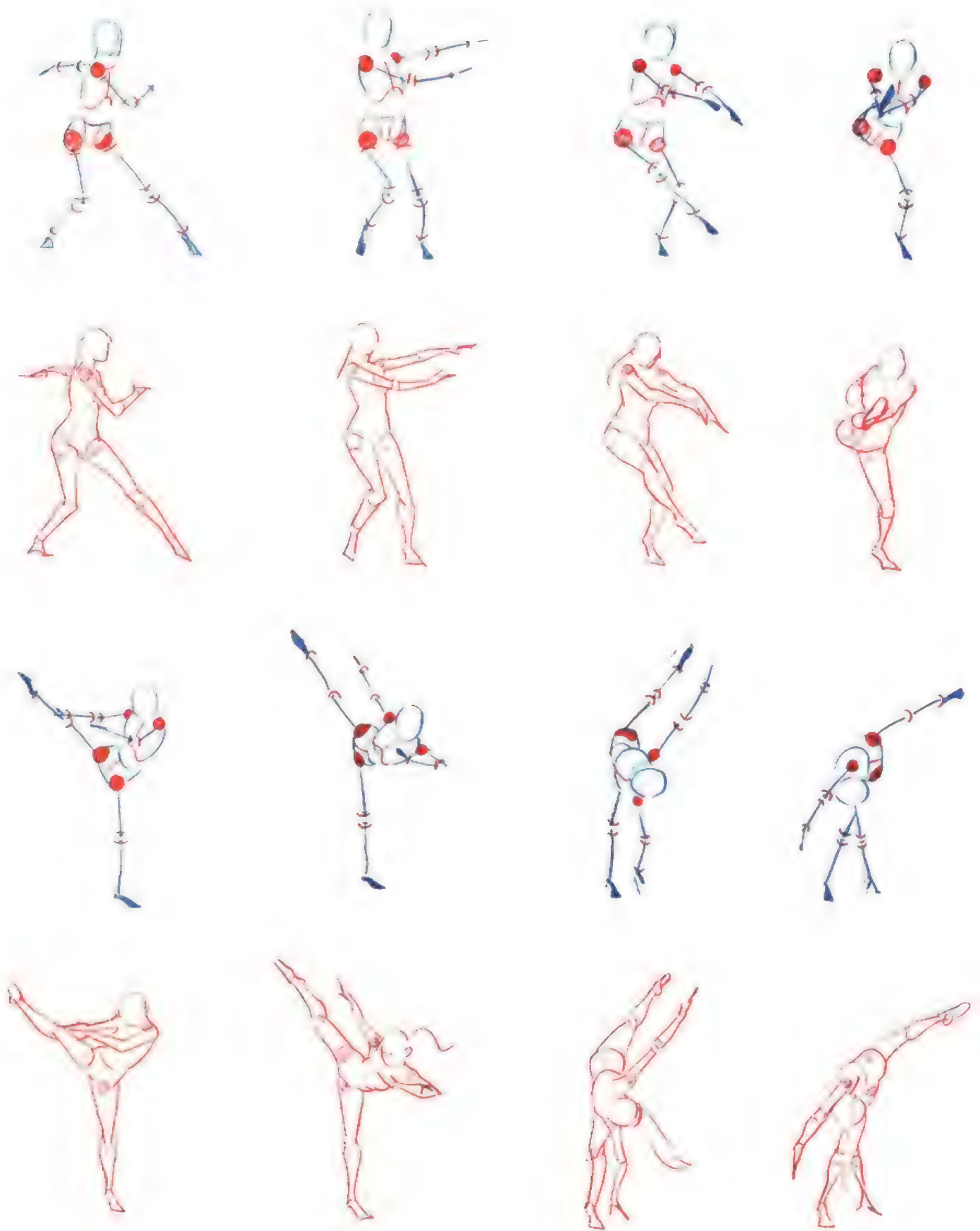


You need to pay attention to the state of the stickman's movement:
It means the change of the cylinder on the limbs. To
draw from Of course, we need to mold the cylinder.
The loneliness of the surface is very sensitive.





In the above three groups of exercises, the human support frame used in each group is forbidden. However, the arc of the loan curtain from the upper and upper garden pillars is different, and the human body dynamics obtained after dispersing are not the same. As can be seen from this, it is extremely important to make good use of radians.



When our control of radians reaches a certain level, we can master the laws of human movement by practicing a series of coherent human movements, which helps us. In the later silent painting of the human body bracket, it showed richer human body dynamics.



When we first started to practice drawing human body brackets, we must find a good reference character. Usually, we seek the help of a professional modeler or a professional actor. Only people who are good at their work can help us with the drawing of the human body. Good reference characters are very important in the drawing of the human body.



05

The relationship between muscles and joints

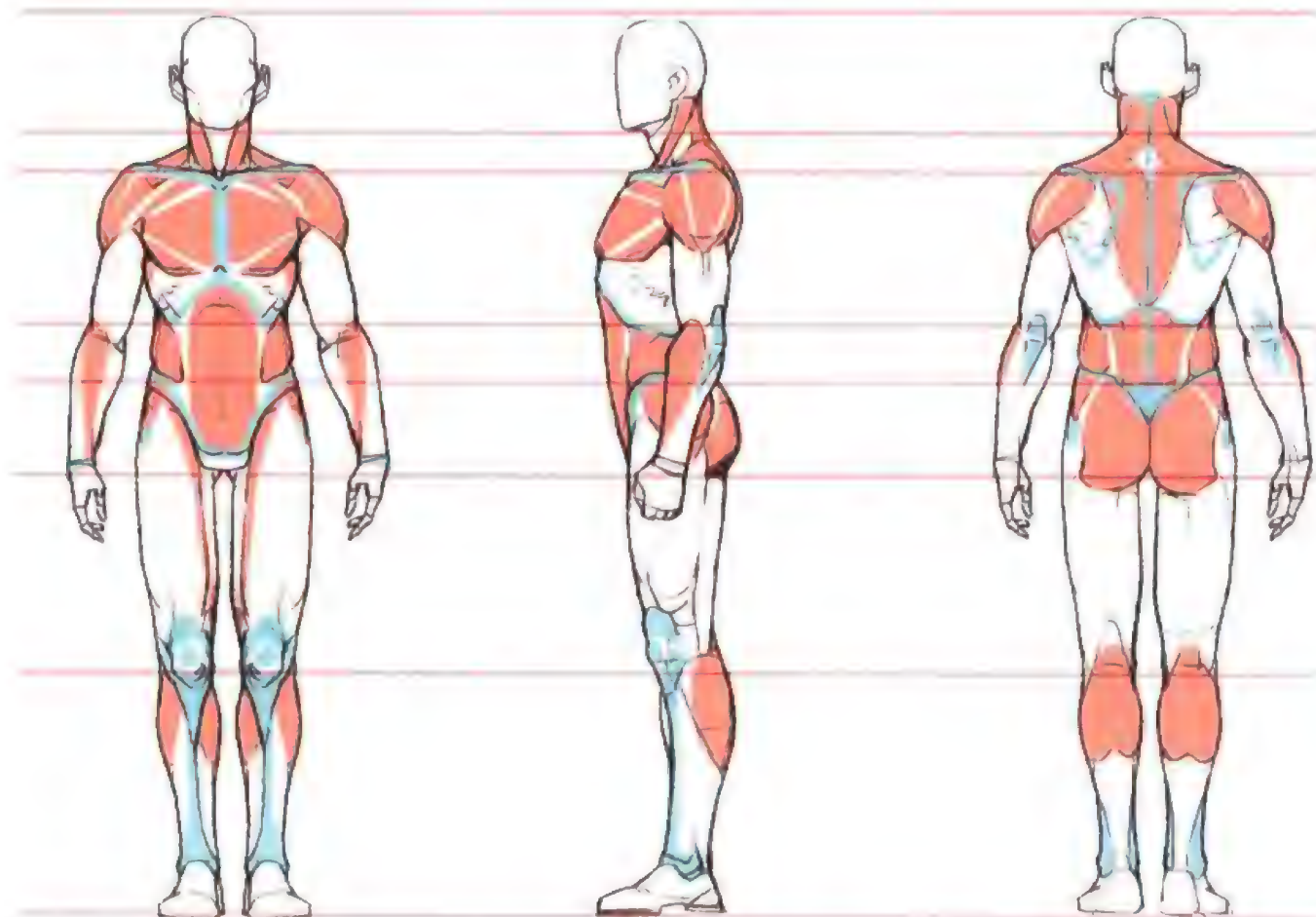
Muscles are like rubber bands on the bone, and the human body can make various movements by squeezing and pulling the muscles.

If you want to draw muscles well, you need to do the following three points:

① **Draw the bones well.** Some people are afraid to draw the bones, but actually the bones are the skeleton. If the bones are not drawn well, the muscles will not be drawn well. Only after drawing the bone path and then drawing the muscles, the human body we draw will not be "even".

② **Distinguish the primary and secondary relationships of muscles.** There are many muscles in the human body. Don't draw every muscle when coloring, otherwise the colored human body will be extremely unattractive. The reason why we need to understand the primary and secondary relationships of muscles is to express a specific shape of the human body. When practicing drawing, first draw the primary muscles, and then draw the secondary muscles. The muscle structure of the joint. When the human body is exercising, the movement of the muscles at the joints changes very frequently. Mastering the drawing of these muscles is very important to draw the muscles well.

A link of.

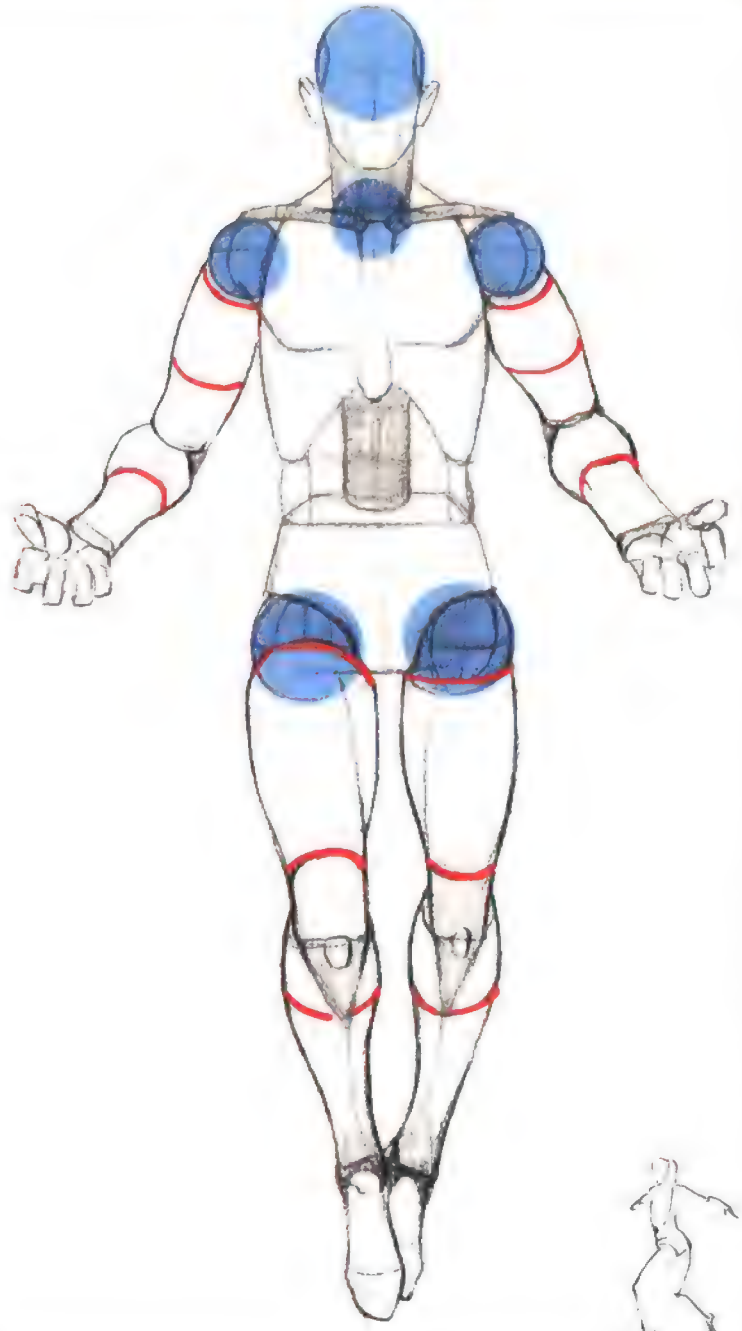




Learn to generalize muscles. When shaping roles, we experience and need to summarize the human body. Therefore, when we understand the muscles, in addition to mastering the basic structure of the muscles, we can also learn to generalize the muscles.

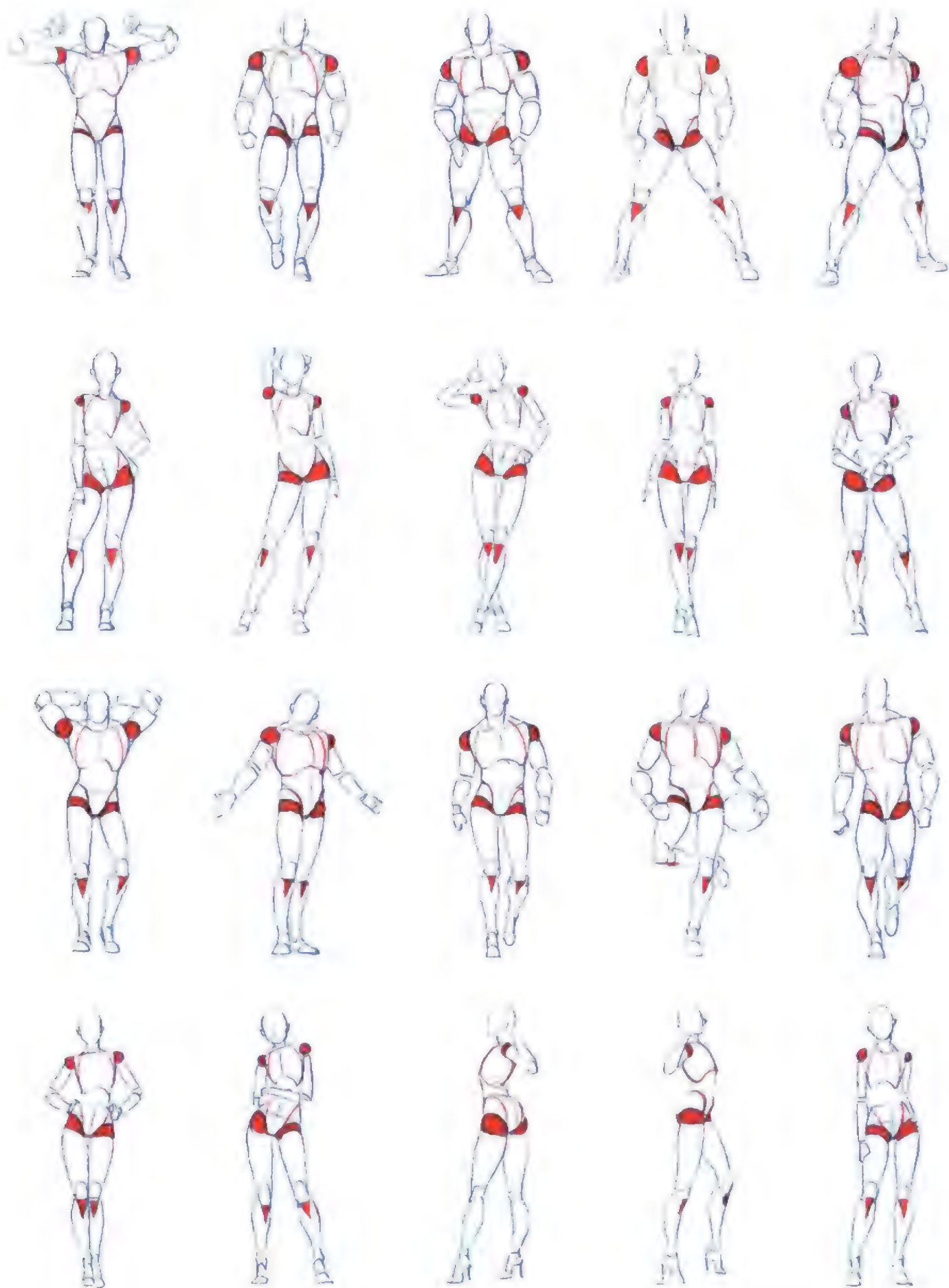
Most of the muscles of the human body will pull or squeeze with the movement of the joints. Among all joints, the joints that we need to focus on are mainly concentrated in the following three areas of the human body.

Spine. There are a total of 33 vertebrae in the human body, and the two parts of the cervical and lumbar vertebrae that are more frequently active are the thoracic and caudal vertebrae. The amplitude of curvature during exercise is not large. When we learn the structure of the body, we should pay more attention to the length of the neck and waist, because the column will only bend during exercise, not become longer or shorter.



Shoulders and fat parts. These two areas are the starting point of the four limbs and the key parts for us to control the movement of the limbs. We can draw four spheres of different sizes in these two areas, which represent the joint balls connecting the four limbs and the torso. The size of a normal adult Huteng sphere can refer to the thickness of the neck, and the size of the bladder sphere can refer to the size of the skull.

Four limbs. The four limbs are the most expressive parts of the human body. The biggest difficulty in expressing the four limbs is that their perspective should be reasonable. This requires us to have a certain understanding of the perspective of the cylinder, especially to control the curvature of the cylinder on the four limbs. They are the key elements that affect the long and short changes of the four limbs in the painter.



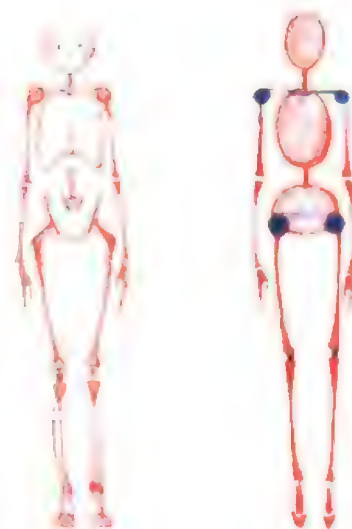
06

Proportional regulation of different characters ?

Before painting the muscles of the human body we can practice regulating the proportions of different characters

When doing this exercise, we can not arrange different poses for the characters first, the characters can stand upright. Therefore, the focus of the exercise is on the regulation of the plane proportions of the characters

When shaping anime characters, we can size and lengthen various parts of the characters. The short regulation facilitates us to better regulate the overall character.





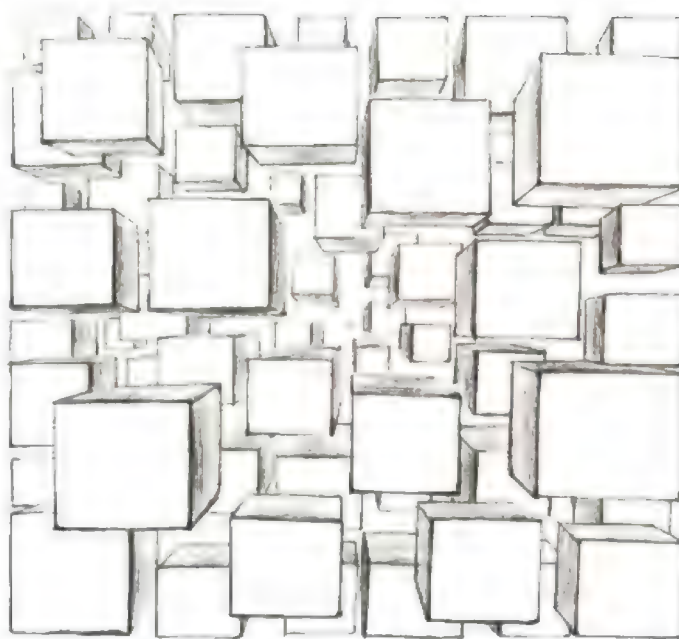
We can first think of the human body scaffold as composed of simple children's bodies. As long as the various joints are handled on the human body scaffold, then we can do the human body's account. Make various adjustments in size, length, etc. with the limbs, so that the drawn characters will be more interesting.

07

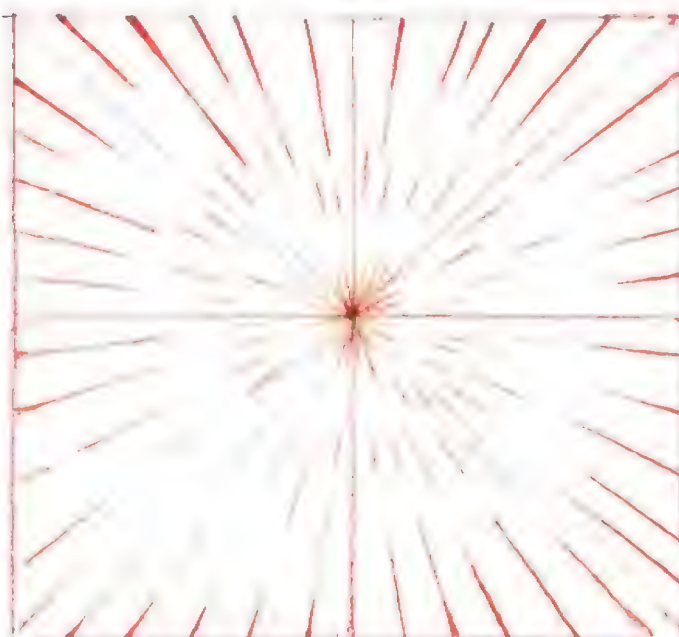
Geometric perspective practice

When painting the human body, perspective exists all the time. By learning the relevant knowledge of geometry, we can get a better understanding. According to the law of perspective

We can try to do the following exercises to improve our own transparency. Depending on the level of cognition.



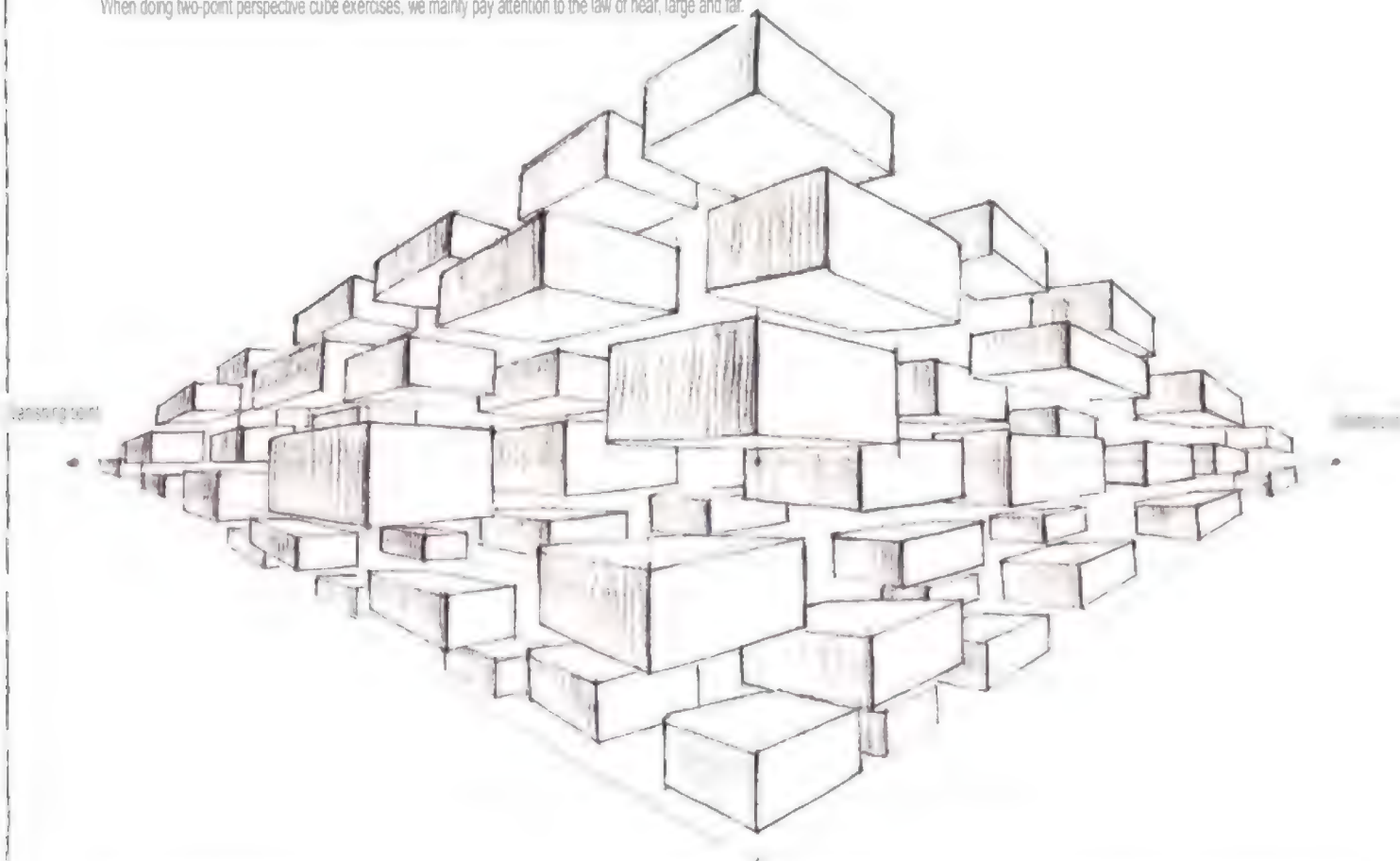
This exercise can be performed in the form of hand sutras and aims to improve Our ability to control straight lines. When we do this exercise, You can first use a ruler to draw the box, set a vanishing point, and draw Draw one or two reference lines, and then use the guidance of the reference line to go straight. Then draw a line extending to the vanishing point.



By making good use of the vanishing point, we can easily draw three-dimensional graphics. One-point perspective, two-point perspective and three-point perspective. These three perspectives are the most common and the corresponding number of vanishing points.

Taking drawing a square body as an example, in the process of perspective exercises, use a good reference line to show the perspective effect of each square. Doing so can effectively enhance our sense of perspective. Ability to control.

When doing two-point perspective cube exercises, we mainly pay attention to the law of near, large and far.



When doing perspective exercises, we can also try to use only some single lines to express the perspective effect. By controlling the length and density of the lines, simple single lines can also show emotion. The

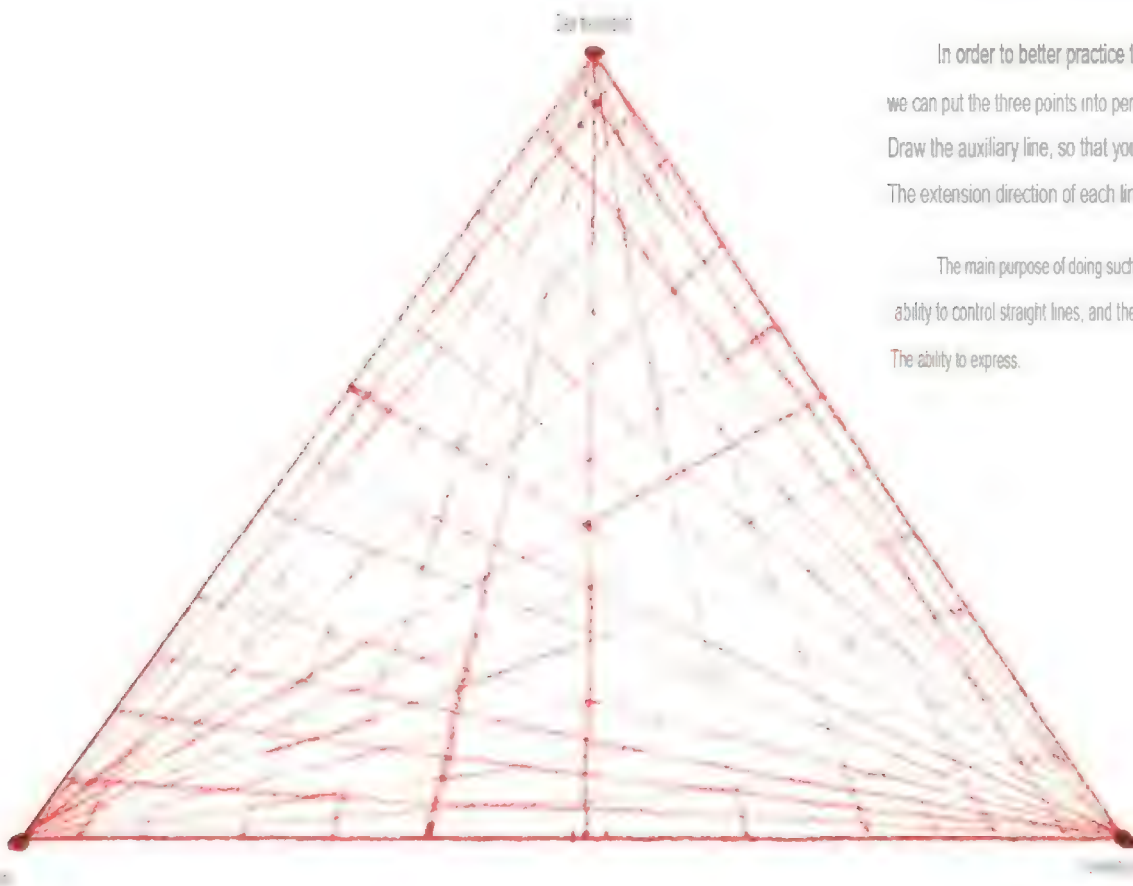
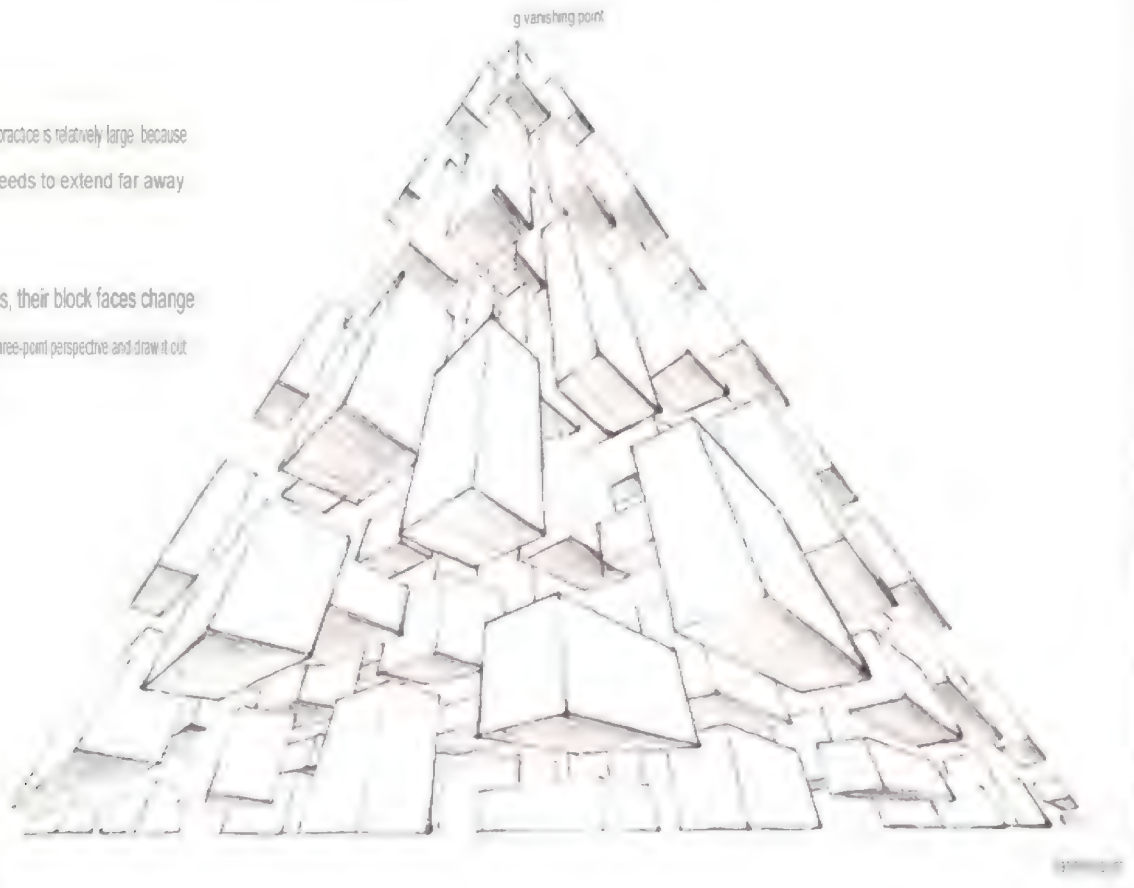
following drawing

In some complex scenes, the placement of many objects is messy, and it is difficult to determine the vanishing point of a single object. At this time, we can adjust the plane ratio of the object by And position placement to show the perspective effect.



The difficulty of three-point perspective cube practice is relatively large, because for every line on the square body, it needs to extend far away to the vanishing point.

Square bodies in different positions, their block faces change. Will be relatively large. Make good use of the principle of three-point perspective and draw it out. The three-dimensional sense of the cube body will be stronger.



In order to better practice the three-point perspective cube, we can put the three points into perspective before drawing the cube. Draw the auxiliary line, so that you can easily find the square body. The extension direction of each line.

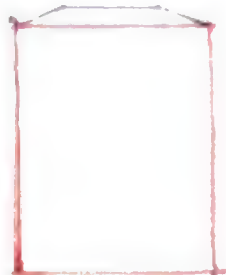
The main purpose of doing such exercises is to exercise our right ability to control straight lines, and the use of these straight lines for space. The ability to express.



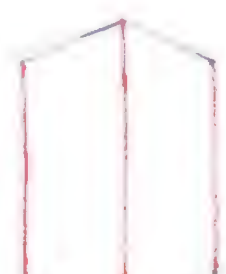


Doing perspective cube exercises is of great help to cultivate a sense of space.

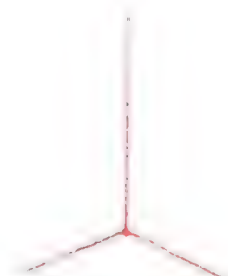
When doing one-point, two-point, and three-point perspective cube exercises, we can use the above three starting methods to quickly draw cubes with different perspective effects.



When doing a little perspective cube exercise, we can first draw a parallelogram, and then set a vanishing point around the parallelogram, and use this vanishing point to draw. The thickness of the cube body. In this way, we can draw a number of perspective squares with different angles.



When doing the two-point perspective cube exercise, we first draw three horizontal parallel lines, then identify two vanishing points, and use the vanishing points to shade the thickness of the cube. So we can quickly draw multiple two-point perspective squares from different angles.



When doing the three-point perspective cube exercise, we should first draw a tripod, and each line of this tripod points in the direction of the vanishing point. With the guidance of the vanishing point, we can quickly draw multiple three-point perspective squares from different angles.

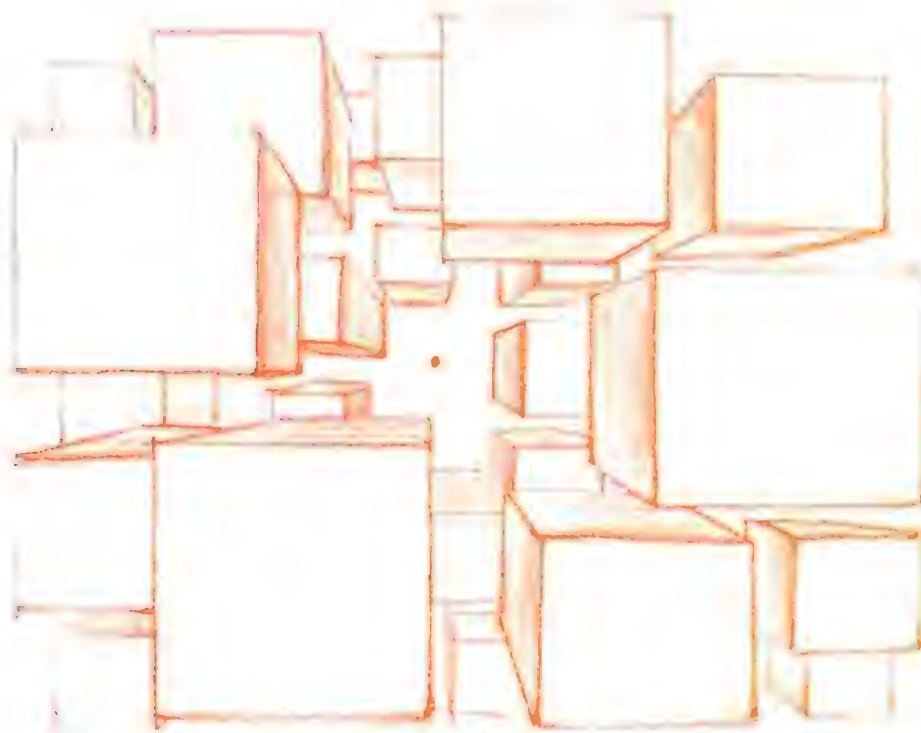
Next, explain how to use the cube body to shape the structure of the human body

When drawing a character, the first thing we have to face is the problem of composition, which is a partial plane perception. When shaping the human body, the content of attention is often some details of the human body, and little attention is paid to the overall relationship of the human body. So to if we want to draw good characters, we need to develop the habit of simplifying graphics.

Everything in the picture can be disassembled graphically.

For spaces that seem to be very complex, we can also use the size and density of the graphics to try to express the laws of space.

The same is true of the human body, as long as we can split the human body, focus on arranging their size in the picture, and then draw. The key parts of the surface show their spatial relationship, and the human body can be drawn quickly.



When using perspective exercises, we can identify some symbols on each surface in space. For example, according to the principle of using the diagonal of a parallelogram to find the center point on the plane, a word "come". When the state of the face changes in perspective, the word "come" on the face will also change.

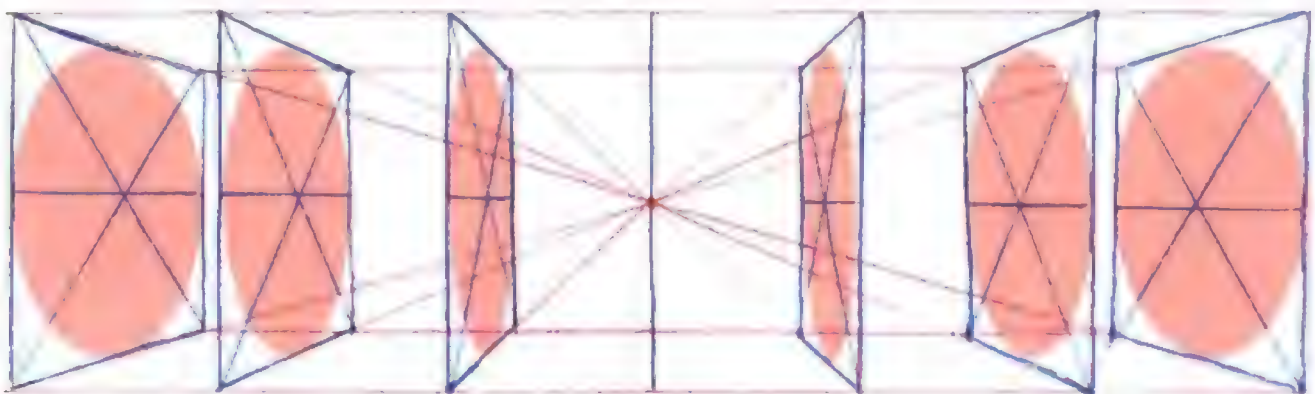
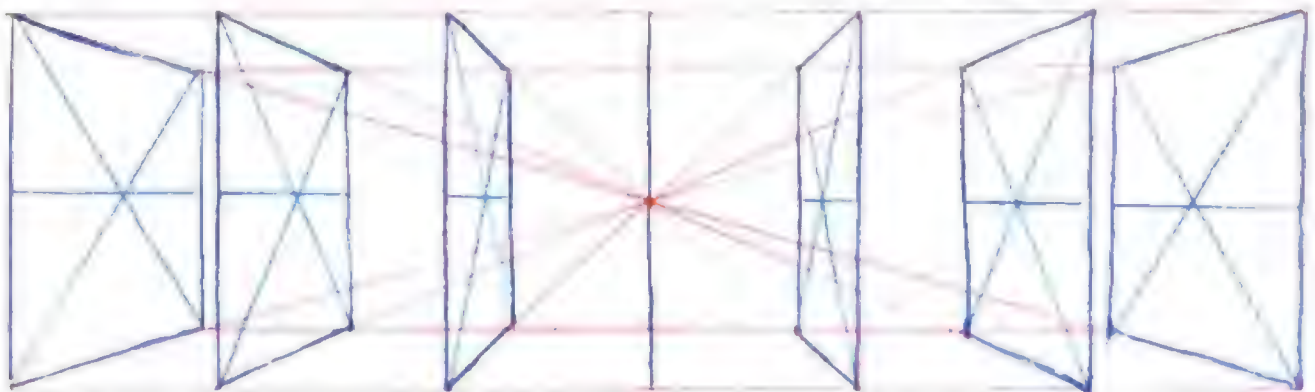


The following exercises can improve our ability to perceive the plane perspective relationship.

Using a little perspective principle, draw seven faces extending into the distance. The states of these seven faces are different, different spatial positions, and the symbols on the faces will also change.

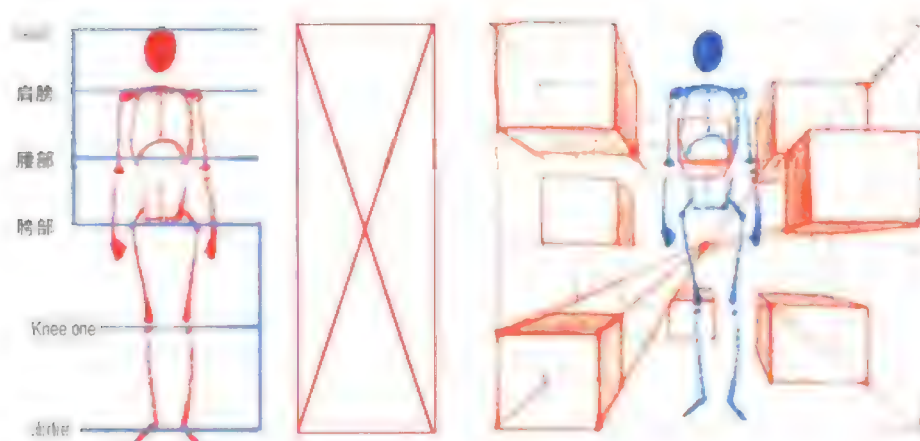
The human body also has such a spatial relationship. When we cross-cut the human body horizontally, the above-mentioned spatial relationships will appear.

The cross-section of the human body is round, and under different perspective states, the edge solitariness of the circle will be different.



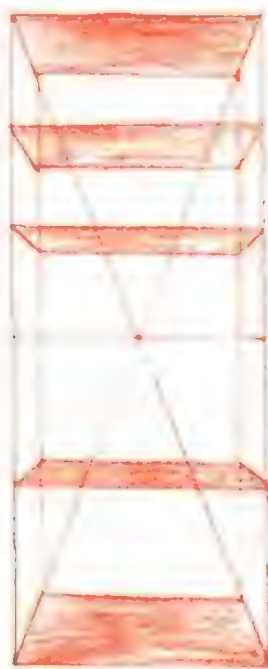
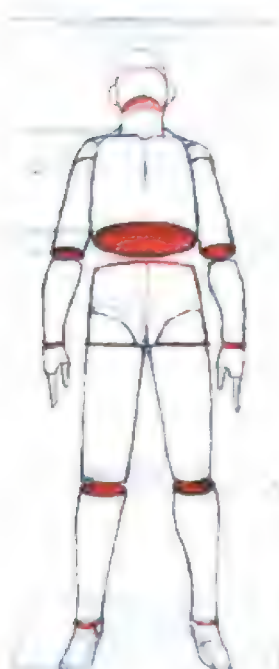
08

How to use the cube body to shape the human body



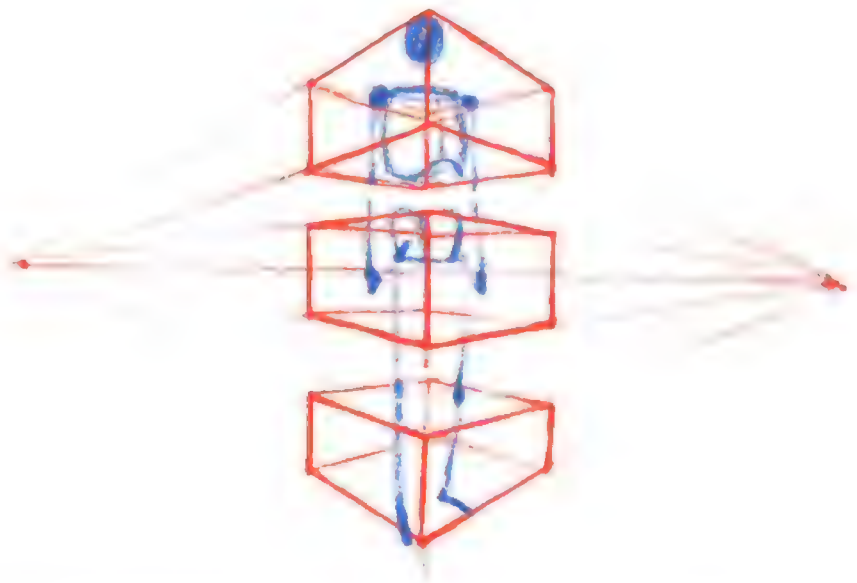
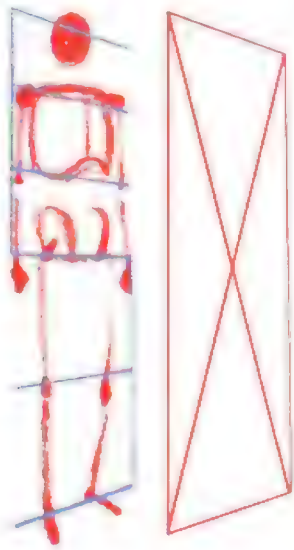
The human body is very flexible and can make many movements just. When you start to do cross-body exercises, it is recommended that you can first draw a person standing upright for our convenience. The perspective of the cube body is for reference.

The cross-body of the human body is many, understood in six positions. They are the top of the head, shoulders, waist, hips, and knees, Soles of the feet. These six positions are all compared with the amplitude of human activity. Large parts.



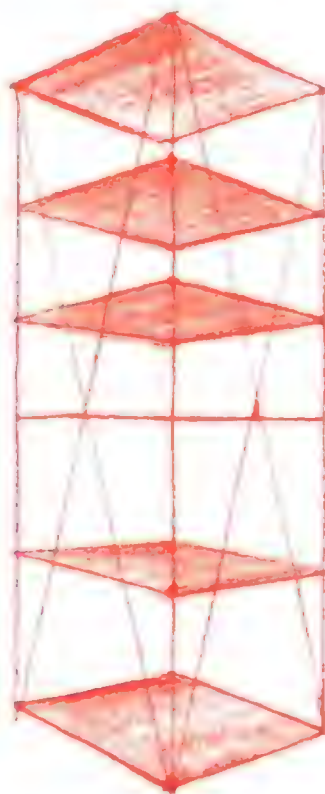
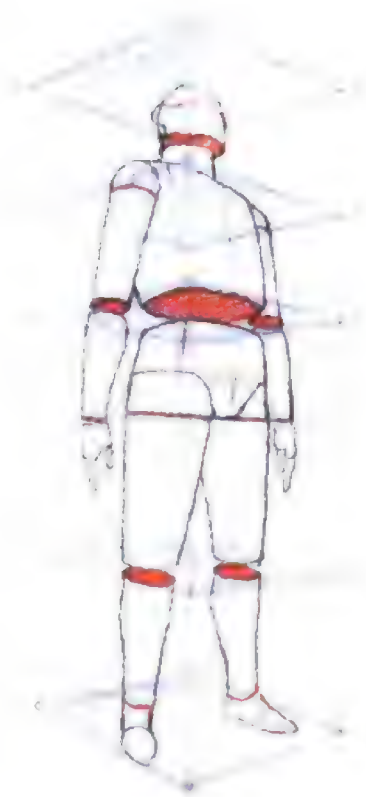
And change.





When drawing perspective, pay attention to the state of the cross-sections of the human body in different positions. In the process of drawing stickman, it is difficult for us to feel the stickman. The reason for the three-dimensional sense is that the cross-section of the stickman is not expressed when drawing it.

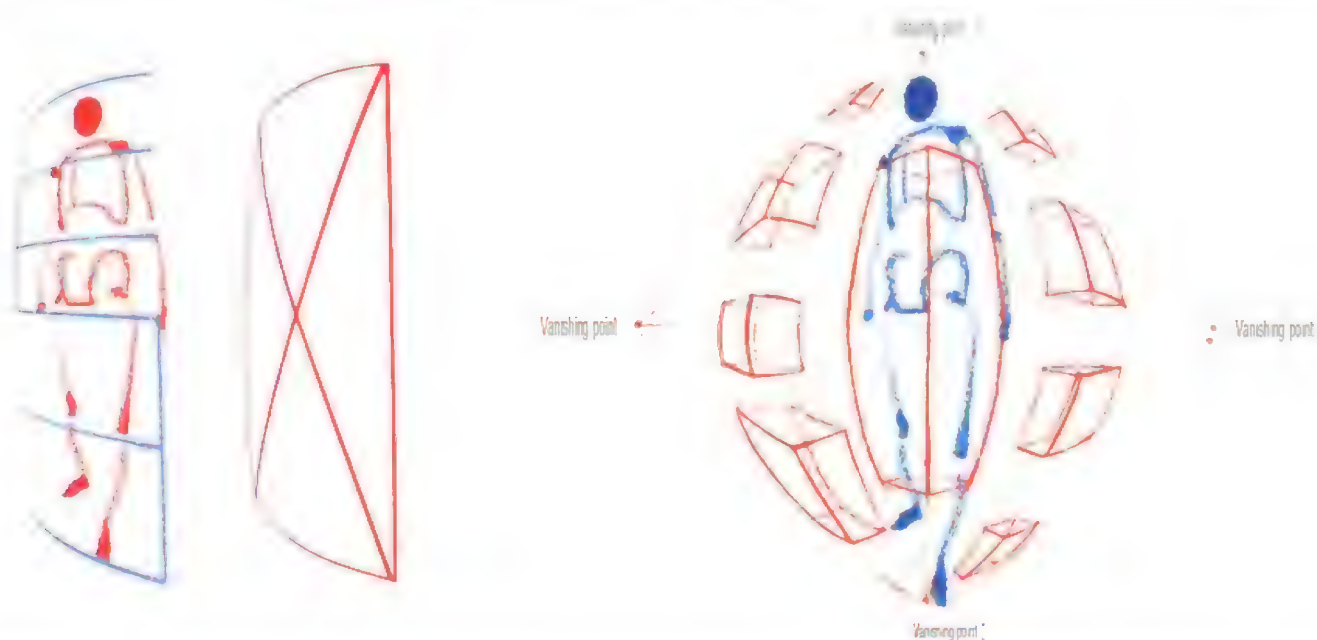
When using the three-point perspective to draw the stickman, we can see the side of the human body. At the same time, we should pay attention to the perspective relationship of the limbs and body proportion of the limbs.



When drawing the human body in the three-point perspective, we should use the cross-section of the body to show the proportion of the human body. At the same time, we should pay attention to the perspective relationship of the limbs and body proportion of the limbs.

In the perspective, we need to flexibly adjust the proportion according to the law of near, large, far and small.

The two-point perspective of the human body can better match the scene and shape the spatial relationship.



The figure is drawn in perspective, and the lines are drawn in perspective. The lines are drawn in perspective, and the lines are drawn in perspective. The lines are drawn in perspective, and the lines are drawn in perspective.

The test line is somewhat similar to the latitude and longitude line on the globe.

In this state of perspective, the proportional division and plane relationship of the human body will be affected.



The square body with a four-point perspective is like a ball being seen from above. The human body is drawn in such a square body, and the lines are drawn in perspective. The lines are drawn in perspective, and the lines are drawn in perspective. The lines are drawn in perspective, and the lines are drawn in perspective.

This kind of perspective is difficult to see under normal circumstances, and it often appears in photographic works shot with specific lenses.

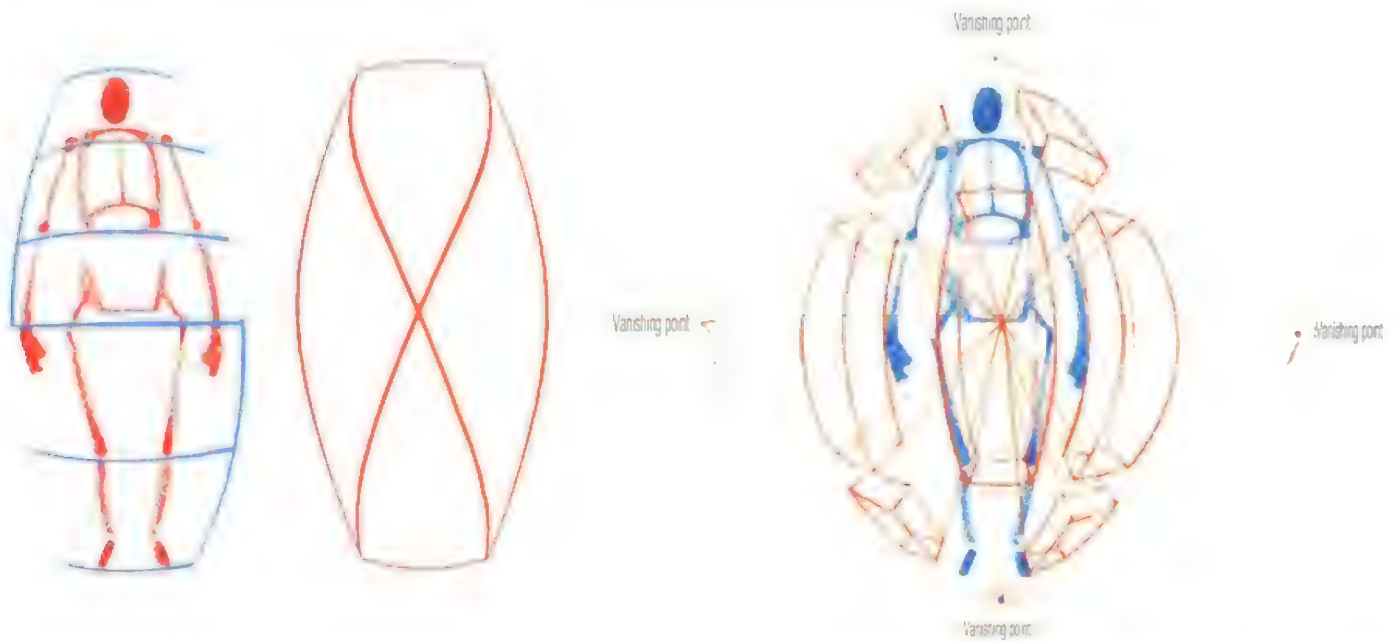
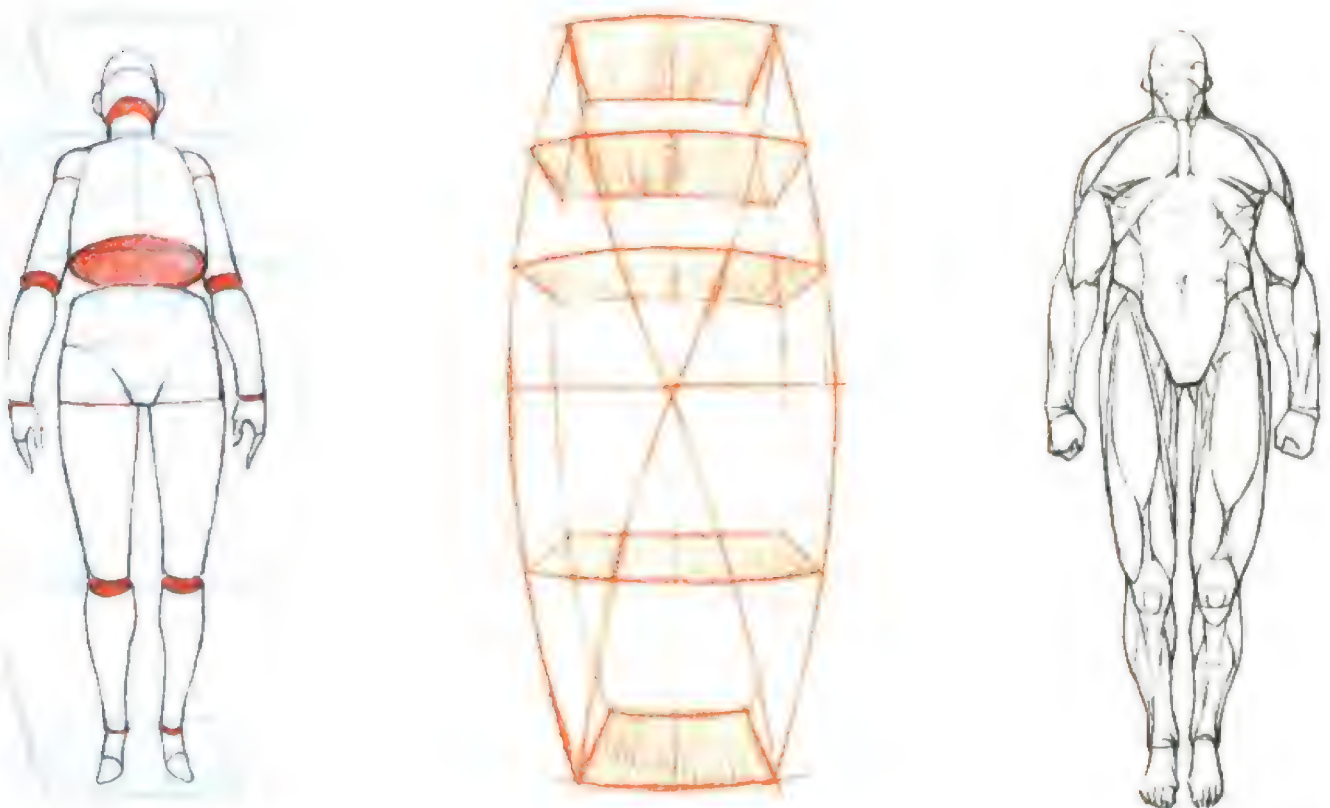


Figure 1-1-1: Construction of a human figure in perspective. The figure is constructed by using a series of horizontal and vertical lines to define the basic shape of the body. The lines are then refined to create a more realistic representation of the human form.

Figure 1-1-2: Construction of a human figure in perspective. The figure is constructed by using a series of horizontal and vertical lines to define the basic shape of the body. The lines are then refined to create a more realistic representation of the human form.



Perspective is a relatively rigorous discipline, covering a wide range of fields. I have only selected a small part of the knowledge to explain. The main purpose is to let everyone better understand the meaning of the relationship between the block and the human figure.

When learning to draw the human body, we cannot simply learn the structure of bones or muscles, but also understand and use human skeletons to draw more interesting human bodies.



09

The relationship between the cylinder and the human body

The human body in different perspectives

Introduced earlier They are all upright If we want to believe

The human body makes different movements in different

perspectives State, you need to turn your attention to the cylinder.

Physically, learn to use the twisting of the cylinder to

A human body that exhibits different dynamics



When painting a cylinder, the main thing to draw is a circle The round section and edge line of the cylinder.

The round section of the cylinder will follow the round cut The position of the surface changes with the change, and the edge line also changes Will scale accordingly.

Changes in the proportion and fineness of the human body and the circle The changes in the cylinder are very similar.

When the human body is in motion, we can To

think of the human body as a tube, the tube is twisting

At this time, the round section and edge lines above change.

The transformation will be great.

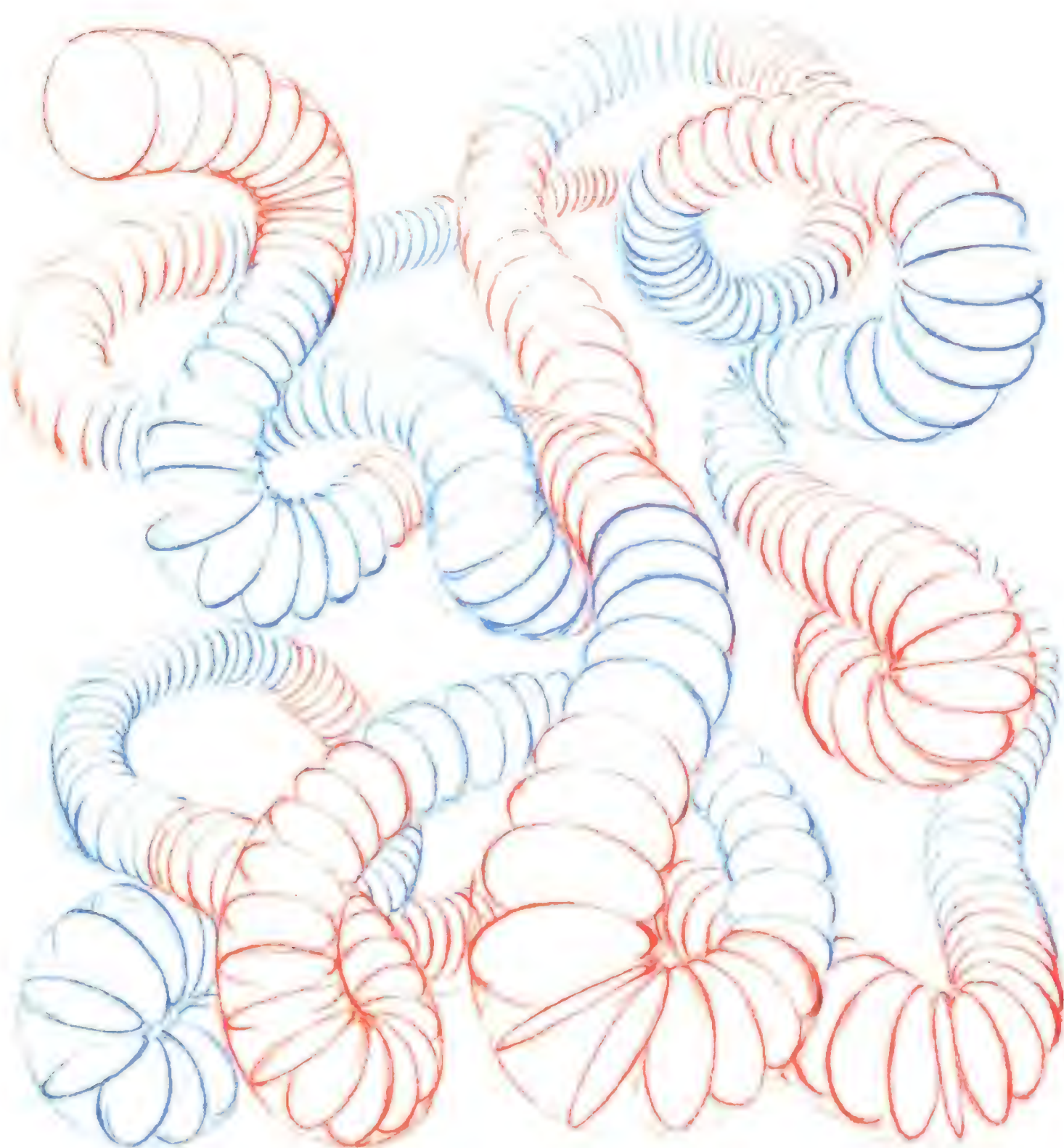
Pay attention to control when drawing twisted pipes

The spacing of each round section on the tube. The

squeezed side has a smaller spacing, and the pulled one

The edge spacing is large.





A single twisted tube is not difficult to draw, but what is difficult to draw is a retracted tube

When practicing drawing pipes, you can disassemble the long pipes into short pieces one by one, then draw the twisting state of each short pipe, and finally stick the short pieces together one by one. Get up and the resulting tube will be very long.

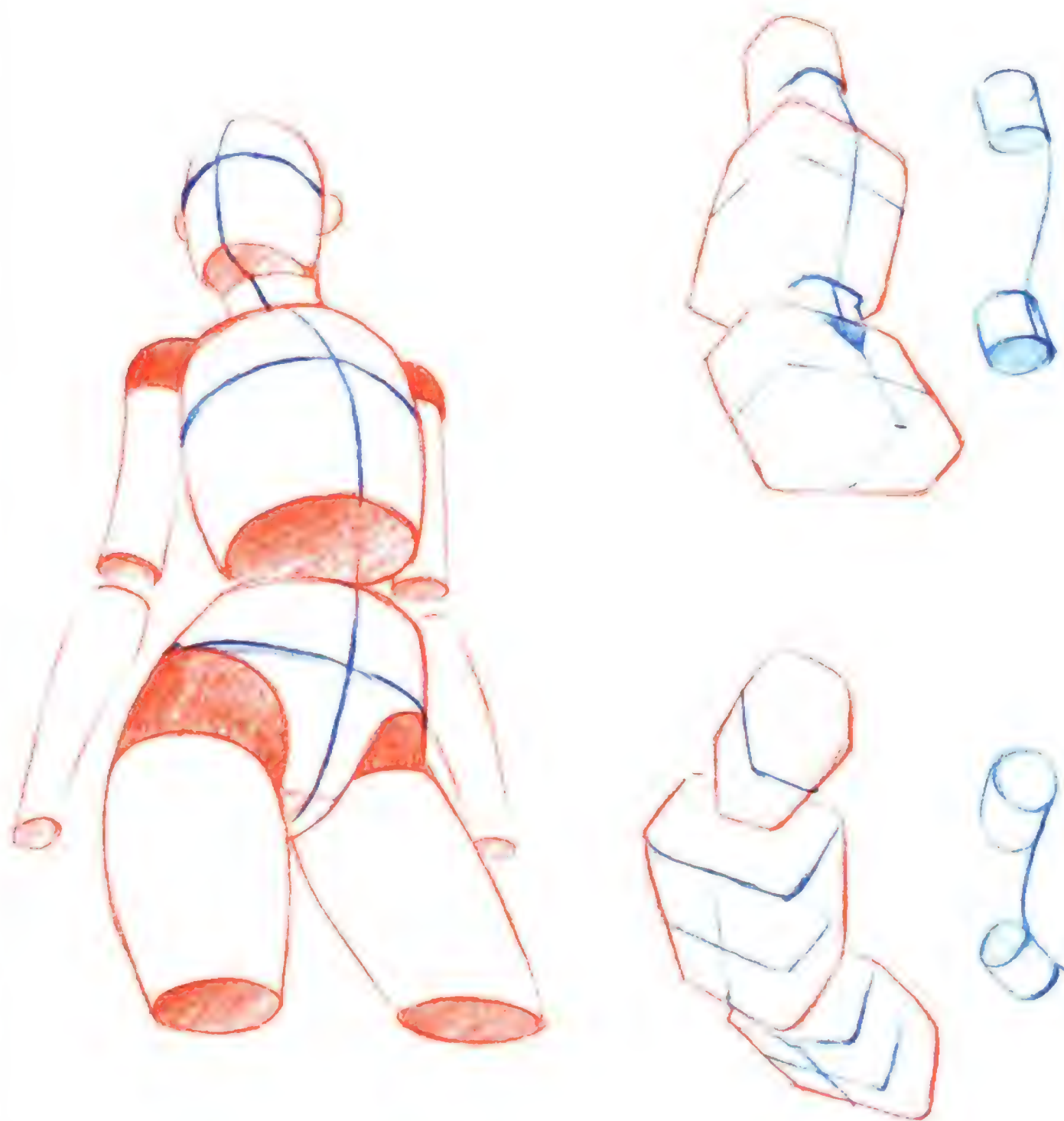
Practicing drawing pipes is mainly to train our sensitivity to the round section of a cylinder. Every twist will change the round section of the tube, depending on the size of the space. In principle, the thickness of the tube will also change.

If you can do a good job of perspective exercises on the tube, it will become very simple to express the dynamics of the human body.



A human body can be regarded as a large cylinder, and every movement may cause its circular section to change. When we observe the human body, we can imagine the joints as being put out, and feel the changes in the round section to people. The different dynamics brought about by the body.

The relationship between facets in the human body is everywhere. When we observe the human body, we should mainly focus on the spine. Column part-the most critical place in the use of cylinders. Every movement of the spine causes the human body to appear different. The dynamics. Pay special attention to the cervical and lumbar vertebrae, which are the most frequently moving parts of the spine.



The solitude of the human body is mainly used to express the state of the spine and limbs

When judging the fitness of the human body, we can think of ourselves as

The character you want to draw, feel that when you are doing the corresponding actions, your body

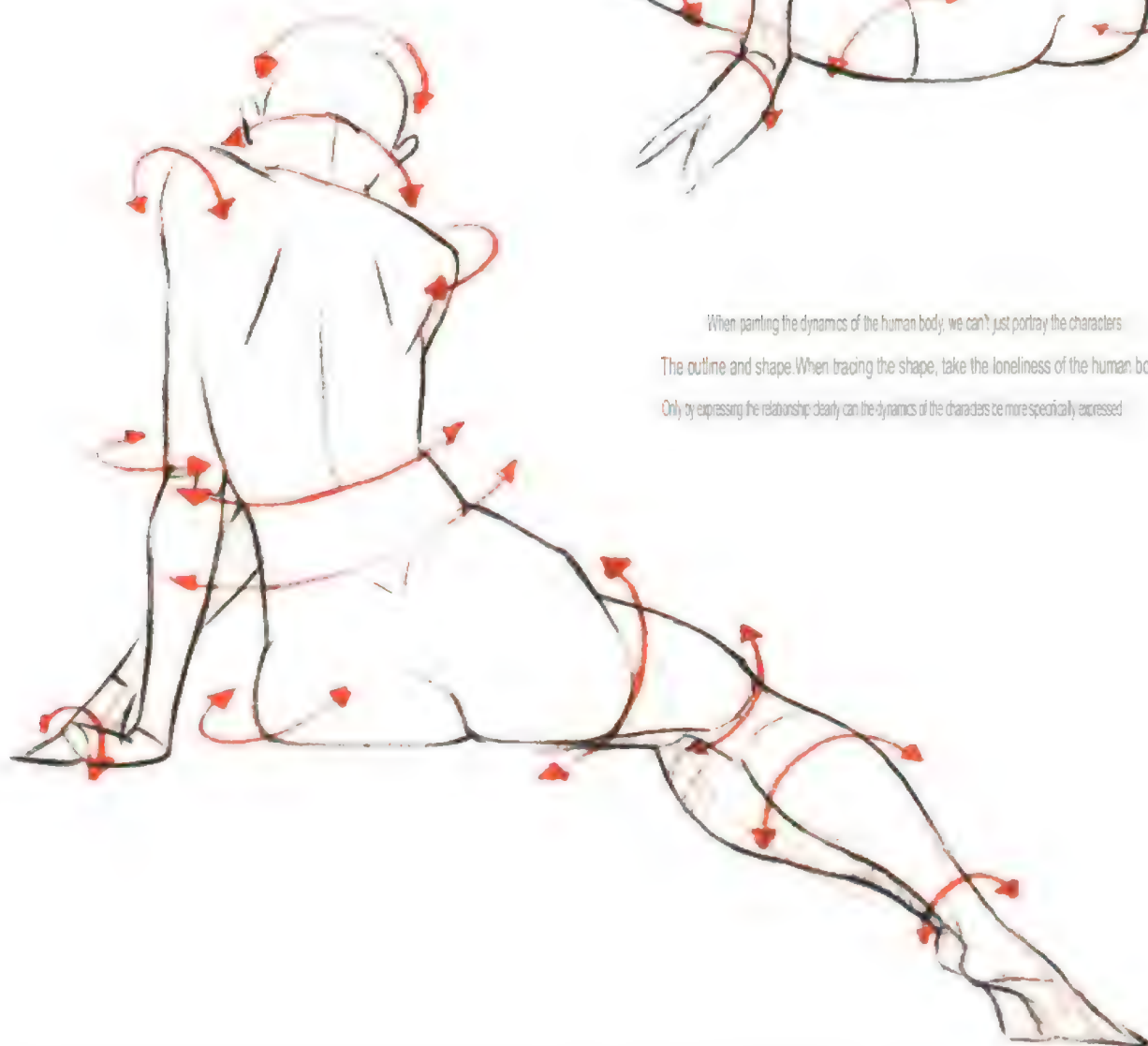
What is the state of each joint part?



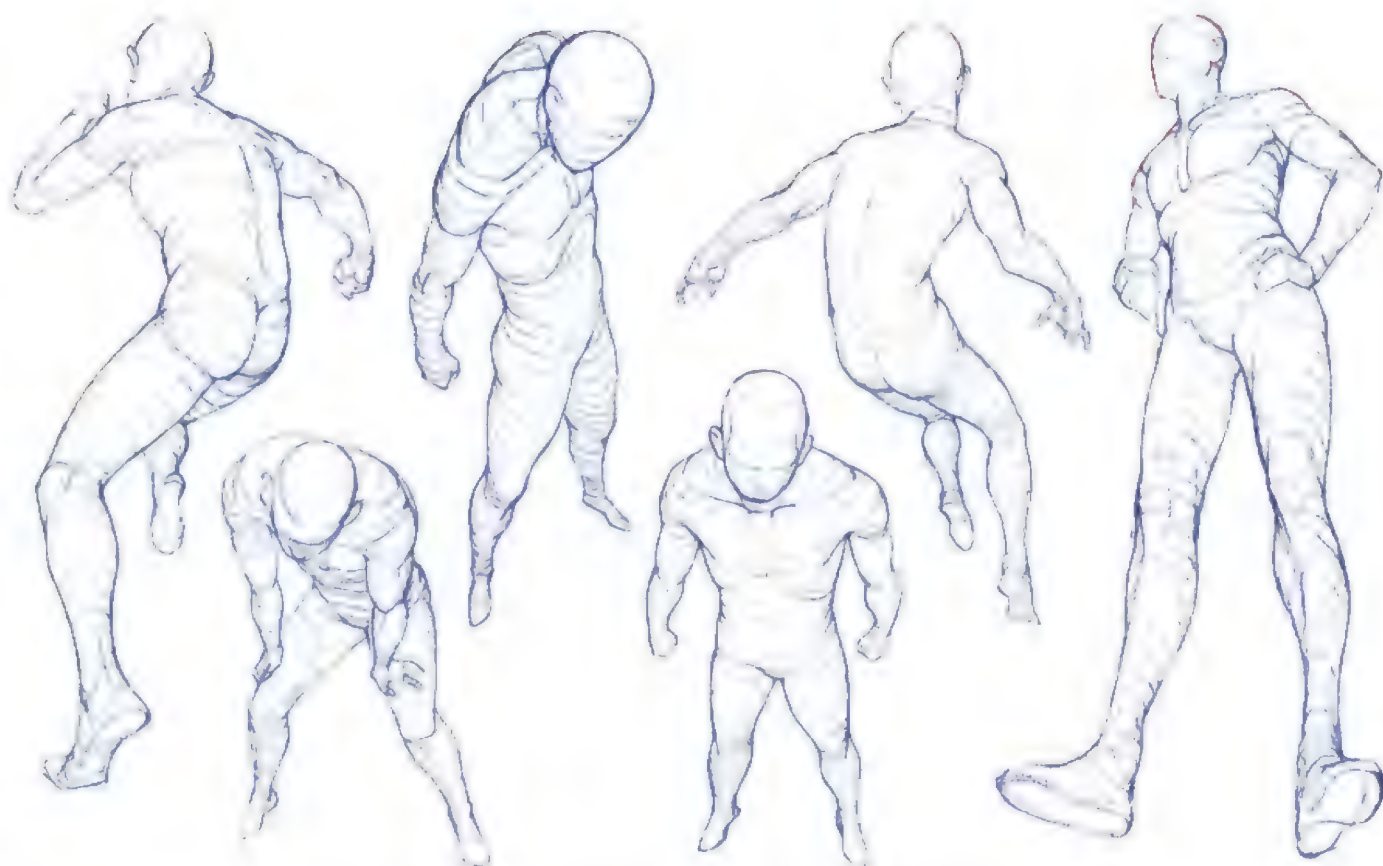
When painting the dynamics of the human body, we can't just portray the characters

The outline and shape. When tracing the shape, take the loneliness of the human body.

Only by expressing the relationship clearly can the dynamics of the characters be more specifically expressed



Solitude exercises are very important for expressing the details of the human body. Great help.

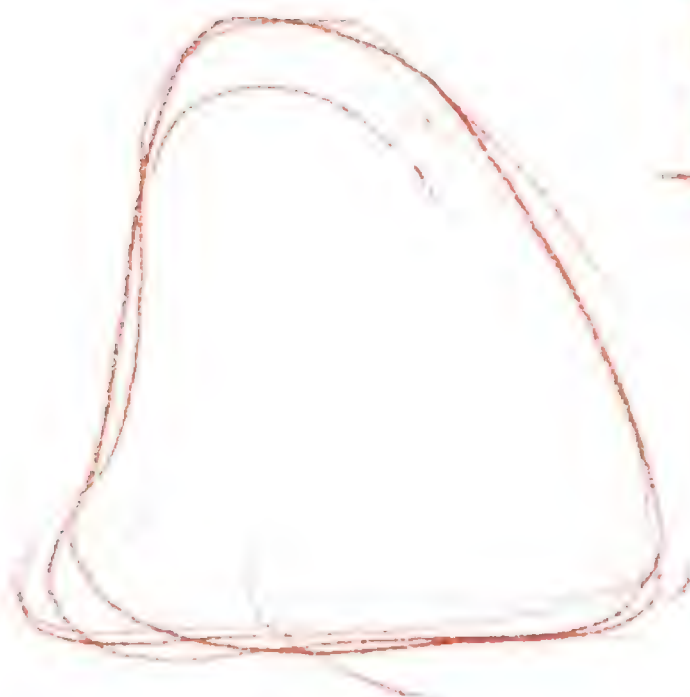


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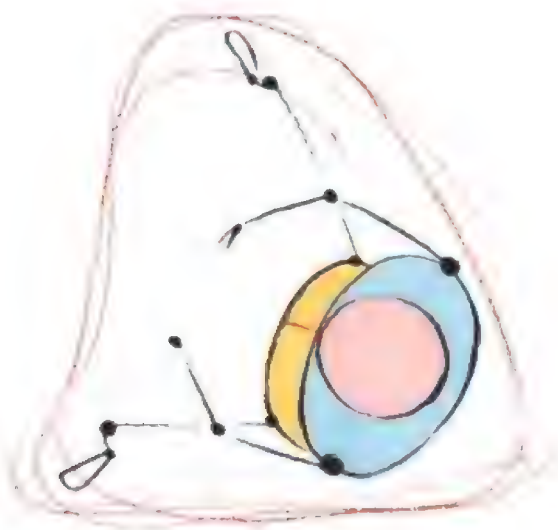
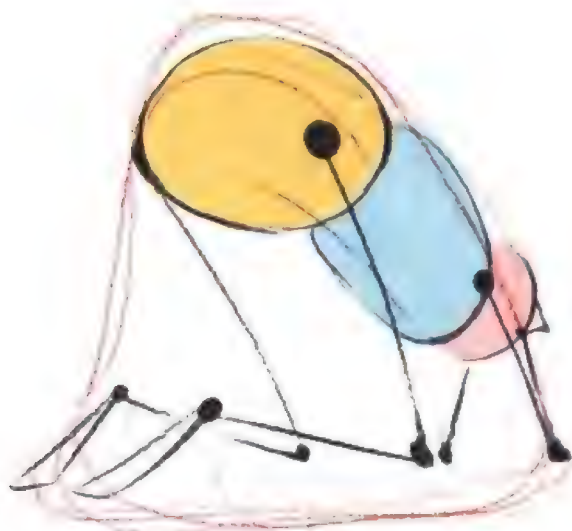
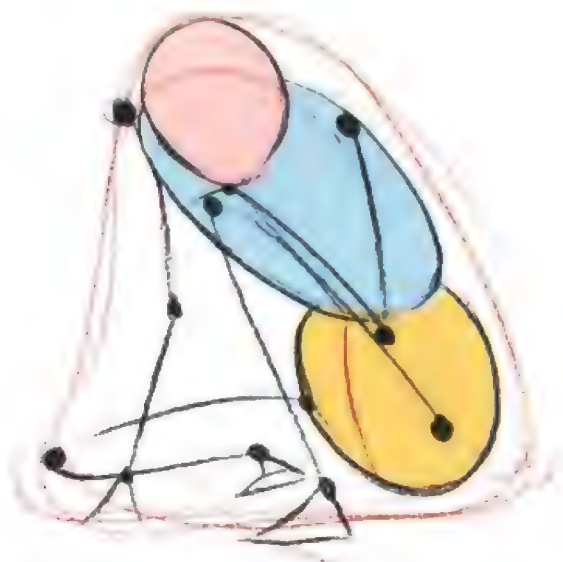
Human body and plane shape

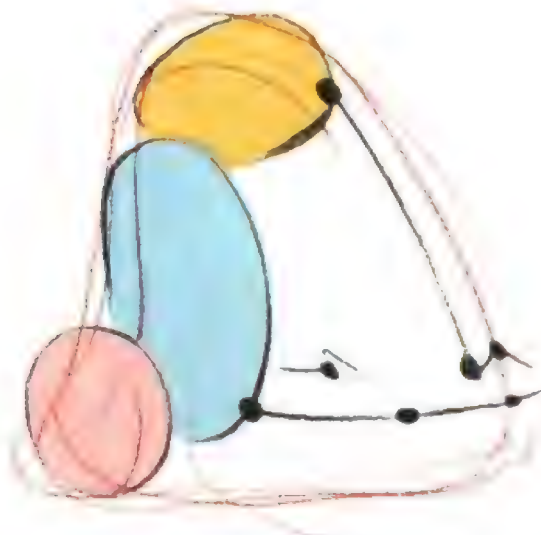
After we have mastered a certain knowledge of human scaffolds, we can be different.

The plane shape gives the human body in different states



10-10







Chapter Two

Head structure

第二章

头部结构



- 一、头部的比例关系
- 二、头部的骨骼结构
- 三、头部的肌肉结构
- 四、头部的毛发结构
- 五、头部的表情结构
- 六、头部的动态结构
- 七、头部的色彩结构
- 八、头部的质感结构
- 九、头部的空间结构
- 十、头部的光影结构

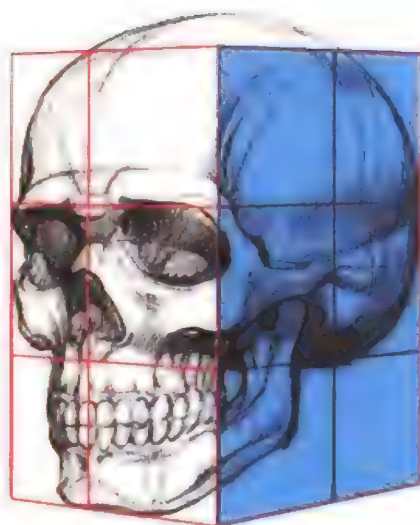
01

颅·Bone, facial bone and lower tilt bone

The head structure is more complex, and different characters have different head structure characteristics.

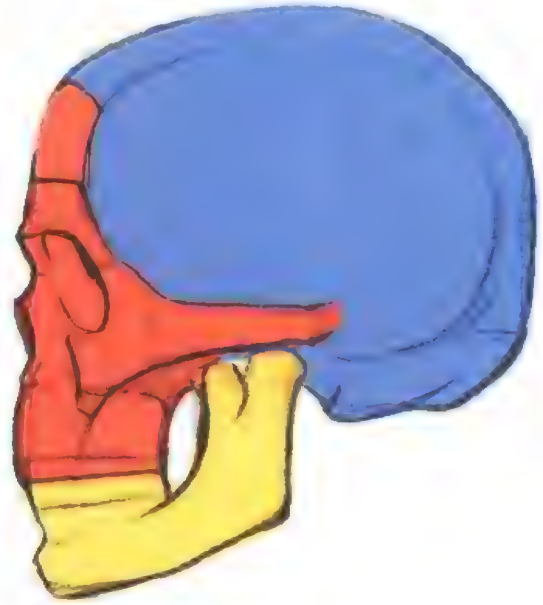
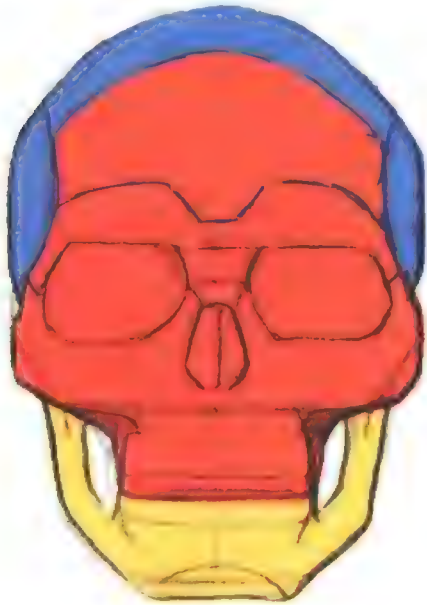
When understanding the structure of the head, we need to disassemble the head to ,
Master the bones, muscles, space, features, expressions, etc. of the head from multiple angles
Knowledge of head structure

We can understand the structure of the human head from the bone structure of the head. Here



The pre-bone is composed of more than 20 bones, excluding ear bones. These bones will undergo certain changes as people age.

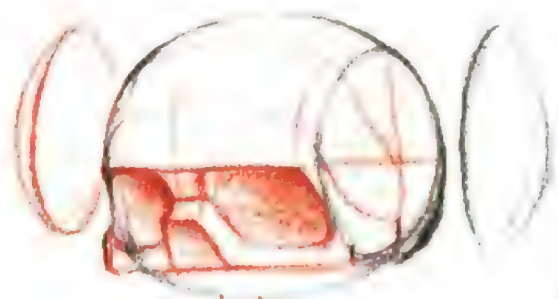
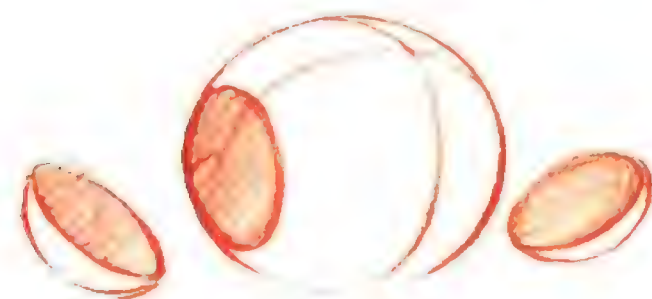
In order to more easily understand the structure of the head, we can flatten the head bone cheese to make the head threefold, that is, to make the head bone cheese appear to be composed of three parts: Formed, leaning bone, facial bone, lower collar bone.



The pre-bone is like a file circle that has been cut obliquely on the left and right sides. These two sections are the parts where the turning point of the head is more obvious.

There is also a section at the bottom of the head, which is the area connecting the head and neck.

We can clearly see the location of these three facets from the front.

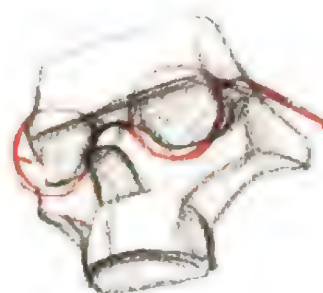
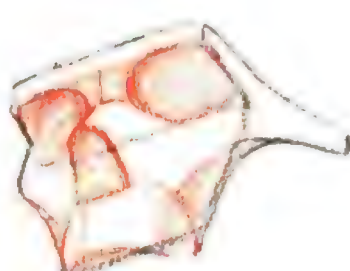
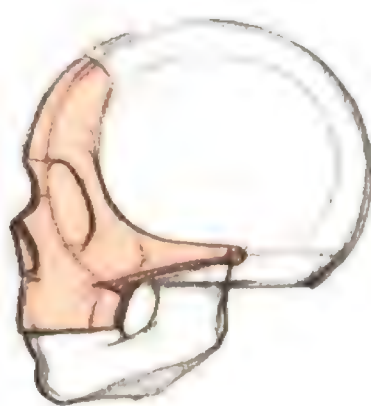
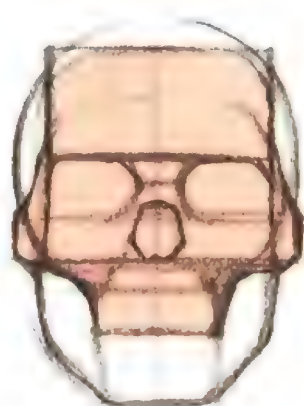
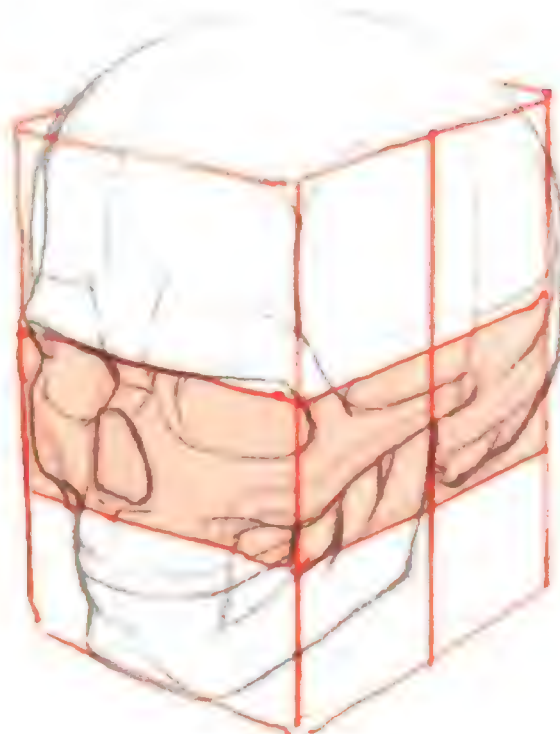


The authors are grateful to the National Science Foundation (NSF) for its support of this research through grant number DMR-0607890.

The parts that need to be highlighted

1) $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \log \left(\frac{1}{\lambda_k} \right) = \int_0^1 \log \left(\frac{1}{\lambda} \right) d\mu(\lambda)$ (where λ_k are the eigenvalues of the operator T_n); 2) $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \log \left(\frac{1}{\lambda_k} \right) = \int_0^1 \log \left(\frac{1}{\lambda} \right) d\mu(\lambda)$ (where λ_k are the eigenvalues of the operator T_n).

The relationship between the ups and downs of the facial bones is more complicated. We can treat this part of the structure as glasses, which makes it easier to control.

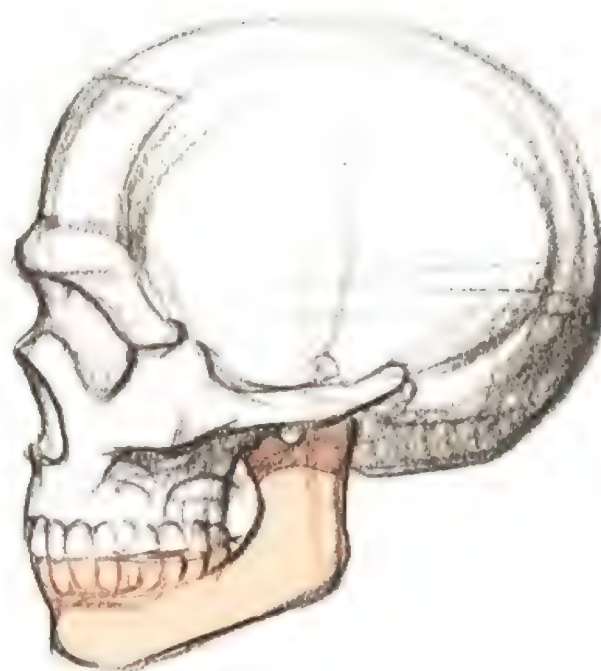
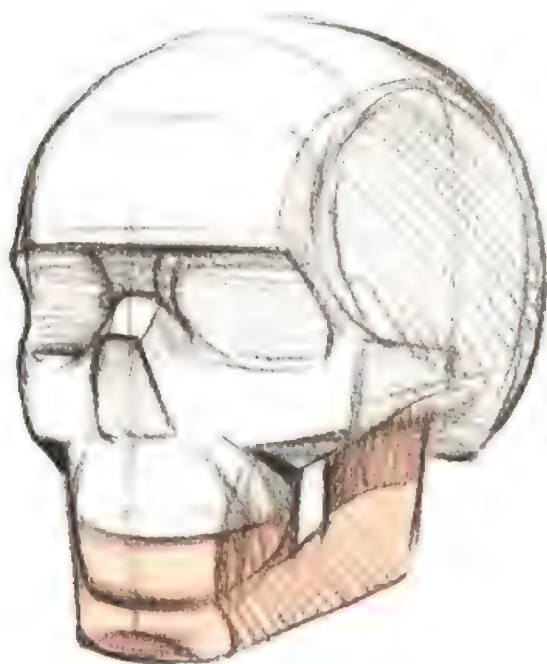


The inferior frontal bone is the only movable bone in the skull.

With the help of the inferior frontal bone, the inferior frontal bone can move forward and backward. When the inferior frontal bone moves forward, the inferior frontal bone can move forward and backward. The inferior frontal bone can move forward and backward.

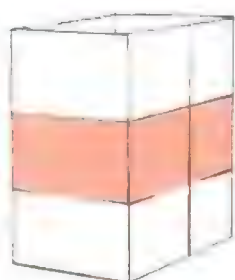
When painting the inferior frontal bone, the inferior frontal bone should be painted in a perspective relationship from multiple angles.

When painting Yan Bone, we need to express its perspective relationship from multiple angles.

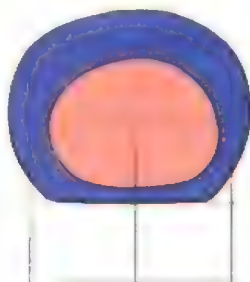
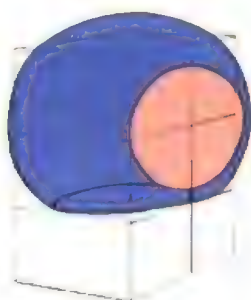


02

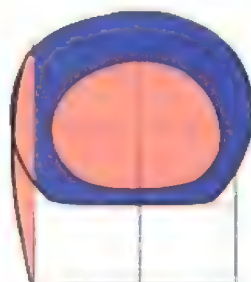
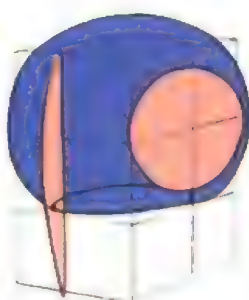
Shaping steps of the head bone path



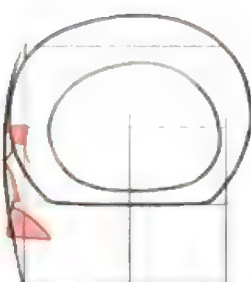
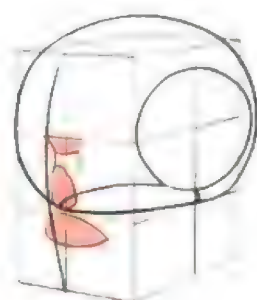
To shape the head bone, you must first draw a cuboid and lengthen this cuboid along the length. The sides are divided equally. If you want to draw a young character, you can turn the red part of the picture down move.



Draw a peach circle representing the pre-bone in the cuboid, and draw three of this peach circle Faceted The younger the character's age the older the pre-bone

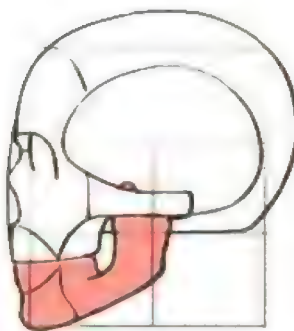
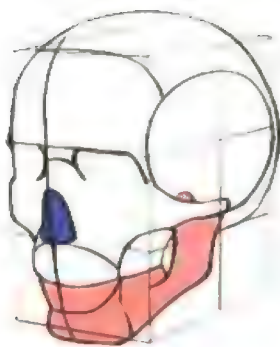
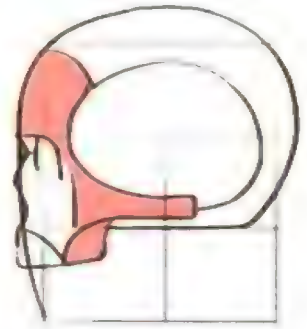
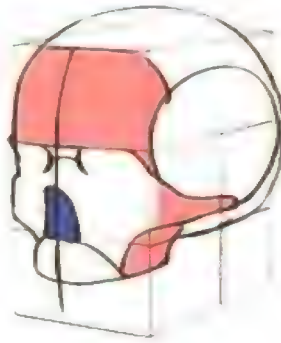


Draw the center line of the head, note that the center line is not a straight line, but will Protruding to the outside, there is a certain arc.



Using the crosshair as a reference, draw the three faces of the eyebrow arch bone, nasal bone, and upper frontal bone Ups and downs of key parts of the bone

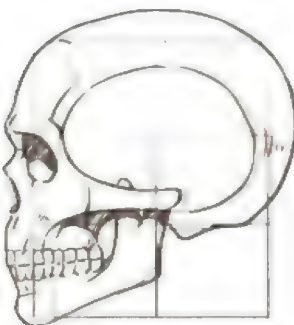
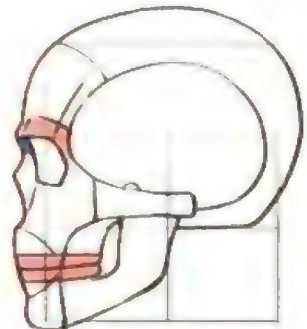
Complete the remaining parts of the frontal bone, frontal bone, and upper frontal bone, and row Create a turning point in the face



Shape the lower face bone

Draw the three main parts of the head in the above order, and the head bone structure is basically formed Shaped.

In order to show the structure of the head more clearly, we can Use some sketch tones to draw the ups and downs of the head, focusing on portraying The phases: the sockets, the bridge of the nose and the forehead bones

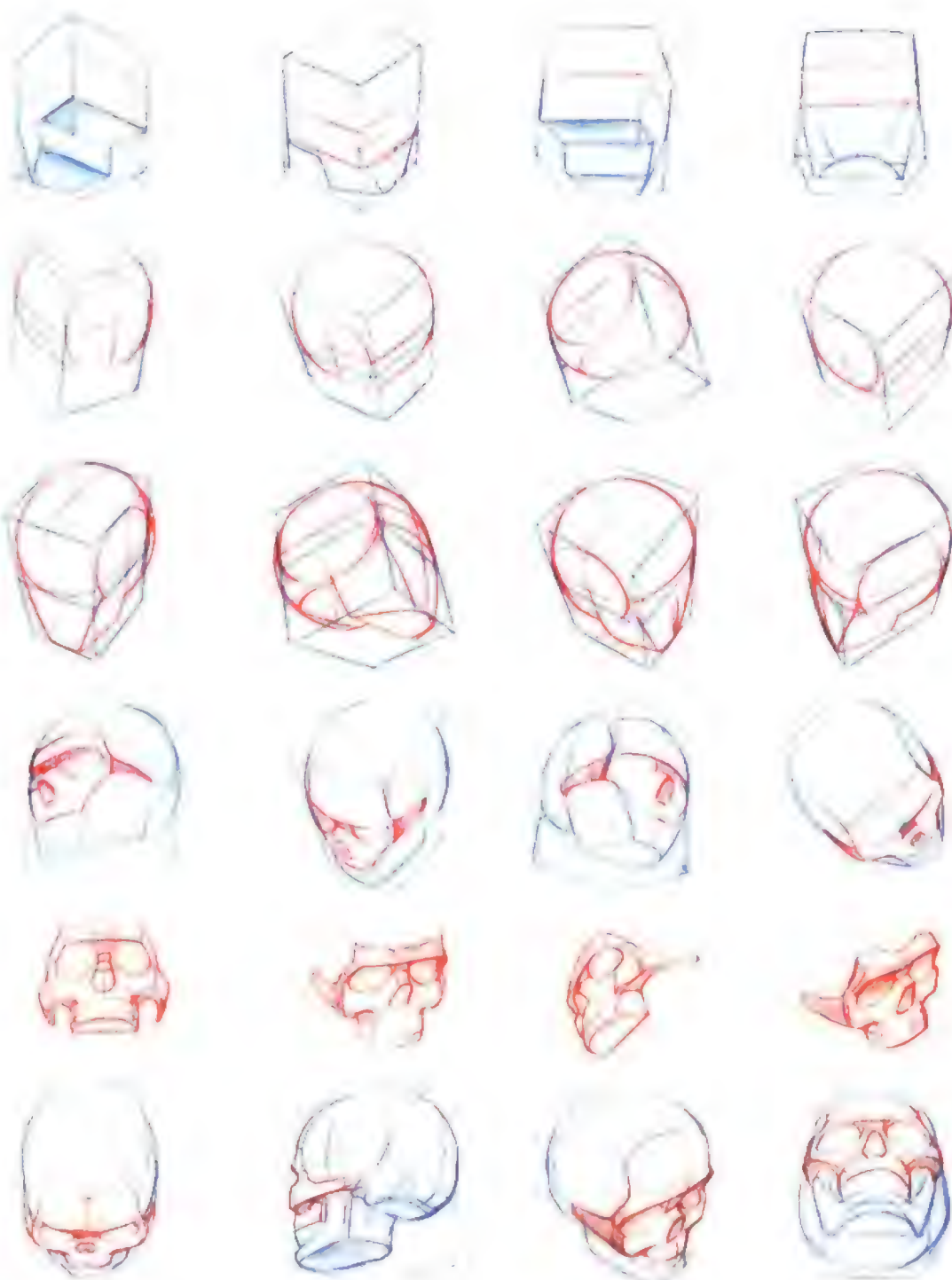


Finish drawing the sketch tone of the remaining parts of the head, showing bone cool The overall relationship



03

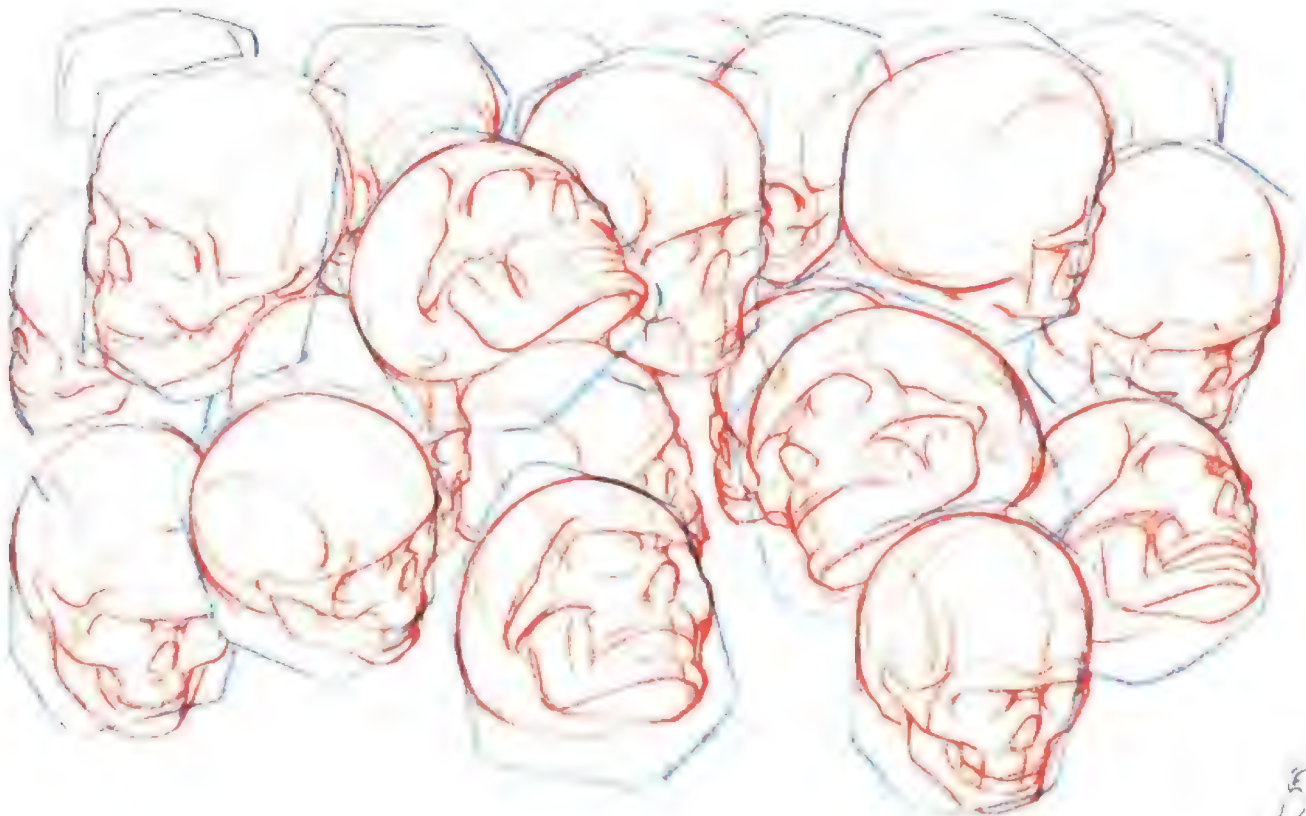
Drawing practice of head bone coins



When you are doing head bone cool drawing exercises, you can do some individual training for each part of the head. Mastering the structure of the head helps us to create better. You

can try to draw some skulls on a piece of paper at will, and then draw them one by one with different needs. This exercise will be very useful for our future character head creation.

Great help.



04

The use of three-division of the head

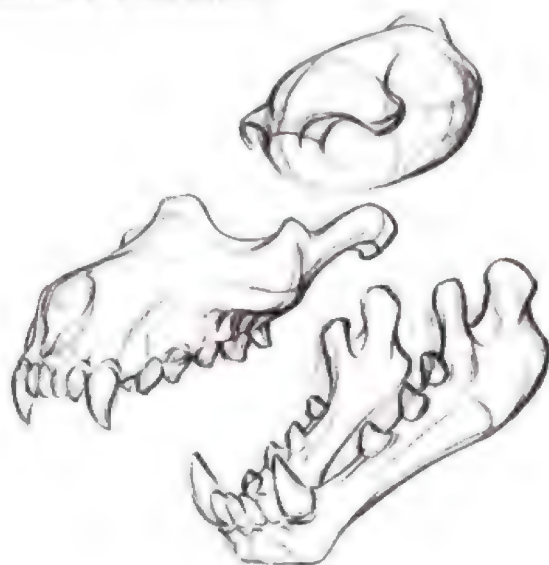
The method of tripling the head is not only suitable for painting human heads. In fact, the head composition of many animals is similar to that of humans.

We can also divide the animal's head into three parts: head tilt, face, and lower collar.

There are many different ways of processing the head of an animal. The tilt of the head, face, and lower head of different animals will be due to different living environments and habits difference. Therefore, when creating animals, we can use this difference to capture the corresponding head structure and process the movements created in this way. Things will appear more vivid.

To express the head characteristics of different animals, you can refer to the quadrilateral or pentagonal of animals, and add few animal specific character head structure using animals.

•Some subjective elements, or make appropriate proportional adjustments



◆ Steps to draw an animal's head



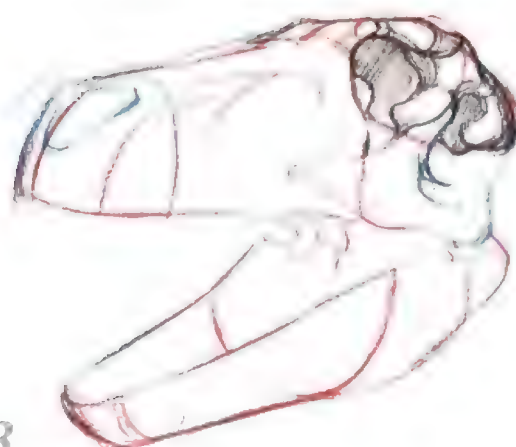
01

Divide the head into three parts.



02

Use lines to mark the ups and downs of the head, making the flat area appear more three-dimensional.



03

Shape the head shape.



04

Shape the details of the face and head tilt, and draw the teeth above.



05

Characterize the lower collar bone and the teeth below to shape the overall ups and downs.

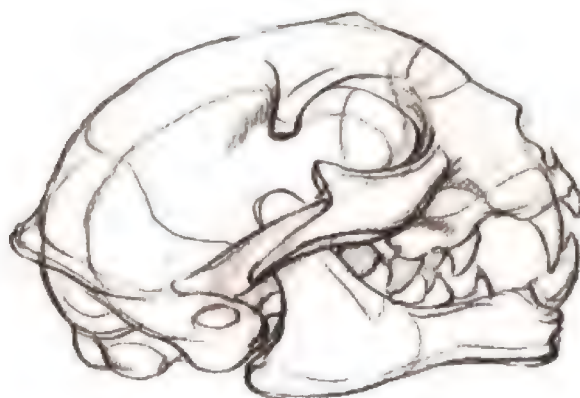


06

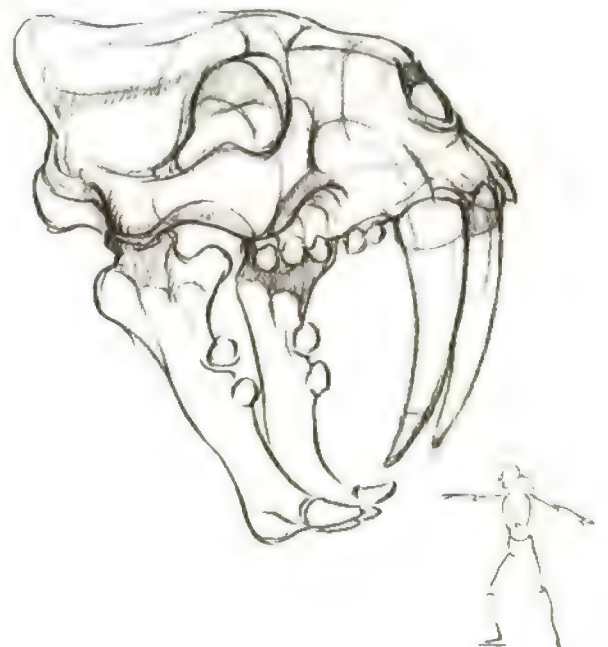
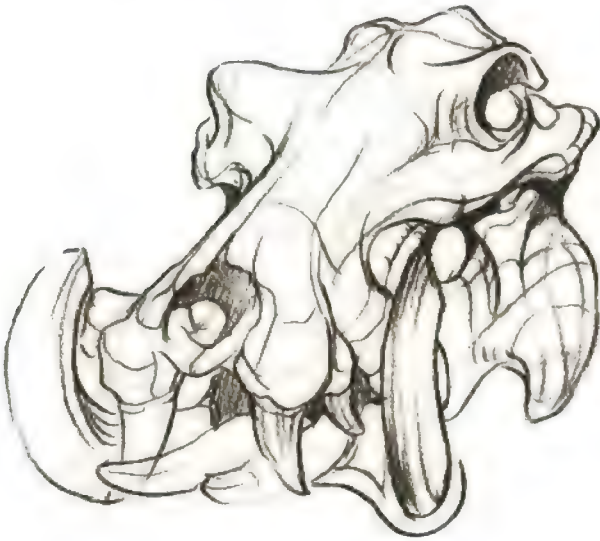
Remove the sketch to get a relatively complete animal head.



We can use the three-point method to practice portraying some animal heads with relatively simple structures



After practicing to a certain extent, we can select the heads of animals with more complex structures and identify their characteristics.



◆ Steps to draw the monster's head !



01

Draw a basic bottom shape.



02

Portray the head, face, and neck on the basis of the bottom shape



03

Portray expressions on the face



04

Refine the face on the basis of sketches



05

Perfect local details.



06

Draw the neck and other parts, and the monster's head is created

The above practice steps can provide inspiration and accumulate experience for our future head creation.



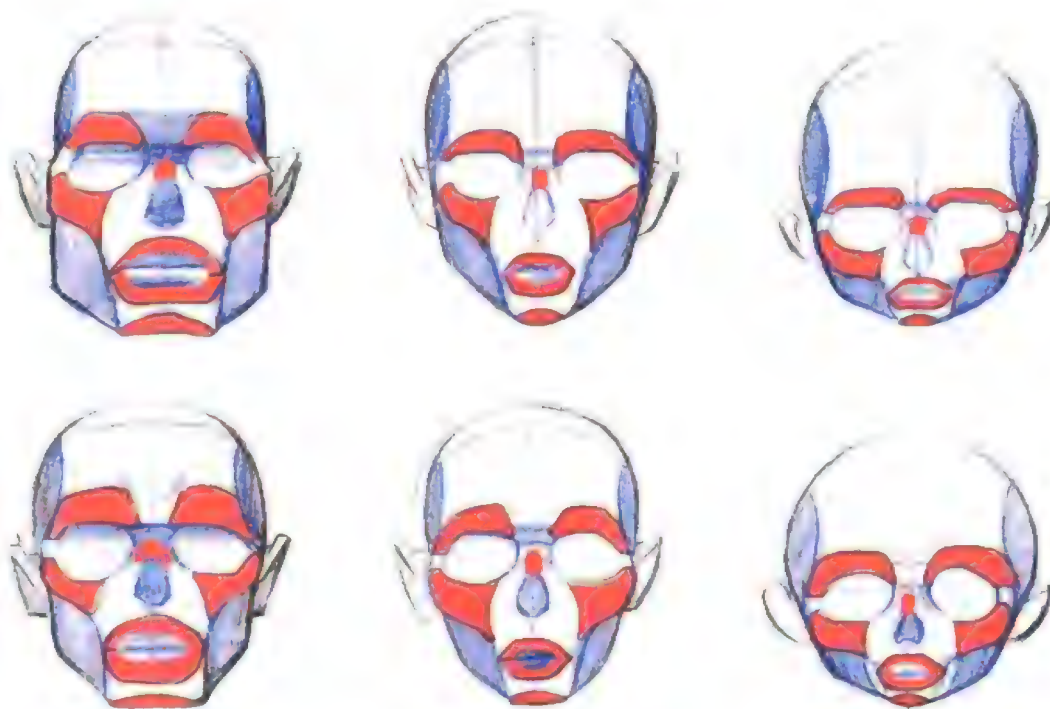
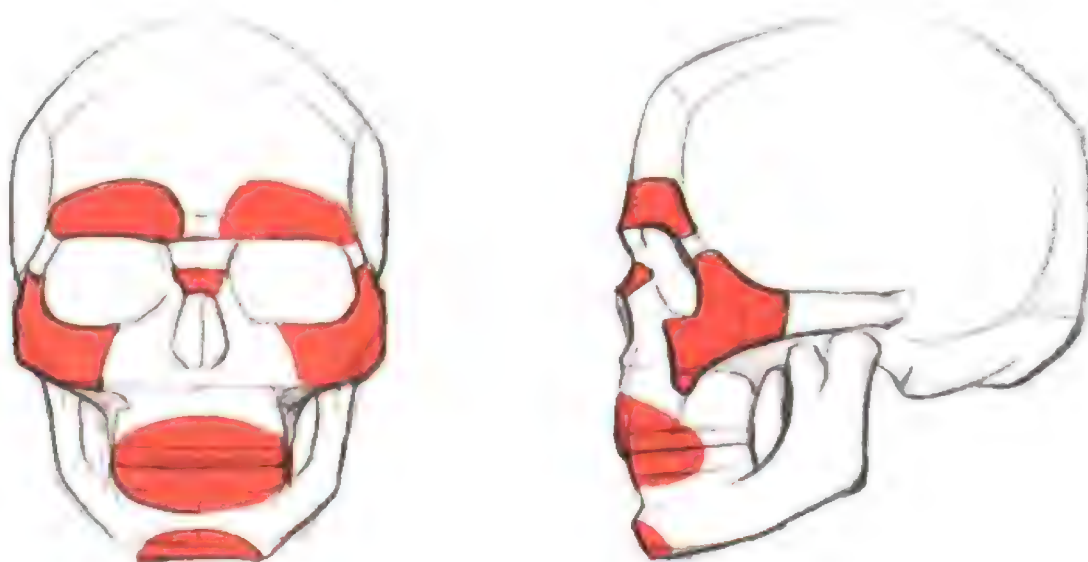
05

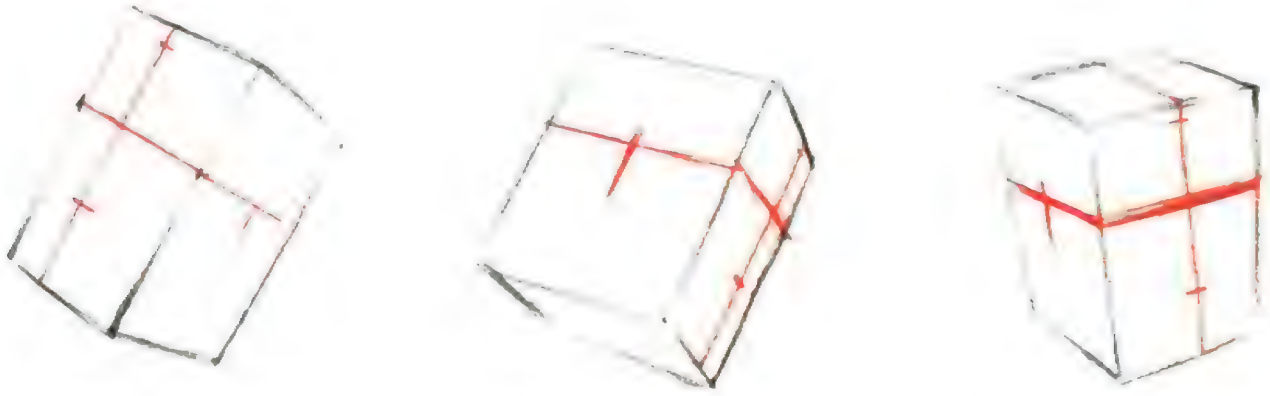
Facial features of the character

We can use the size and ups and downs of the red area (facial structure) in the figure below to reflect the facial characteristics of different characters, different ages and genders.

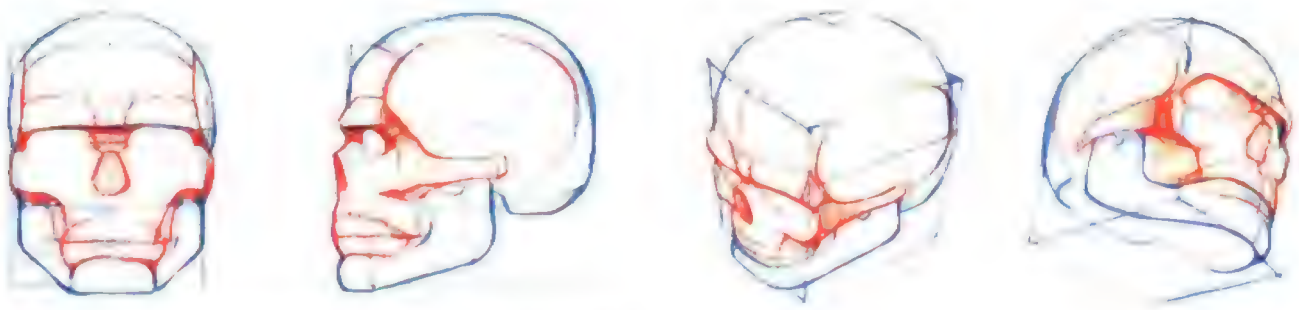
People of different races have different facial features

When we differentiate the faces of the characters, we can try to adjust these red areas.

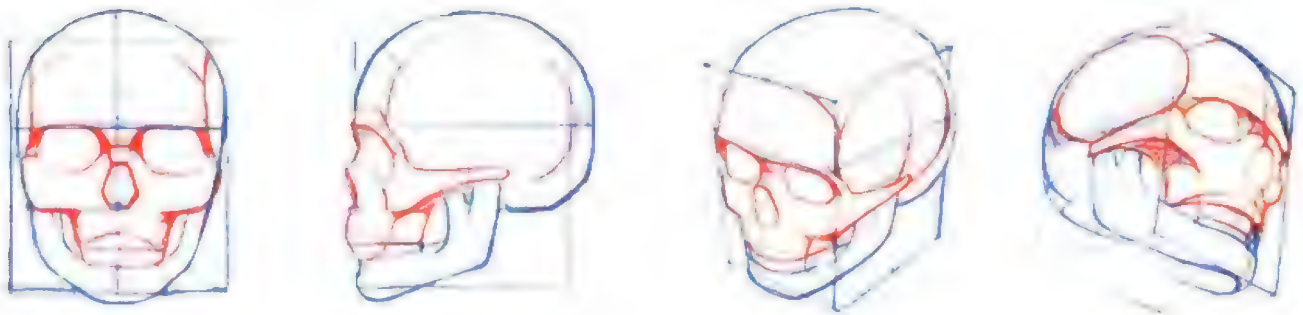




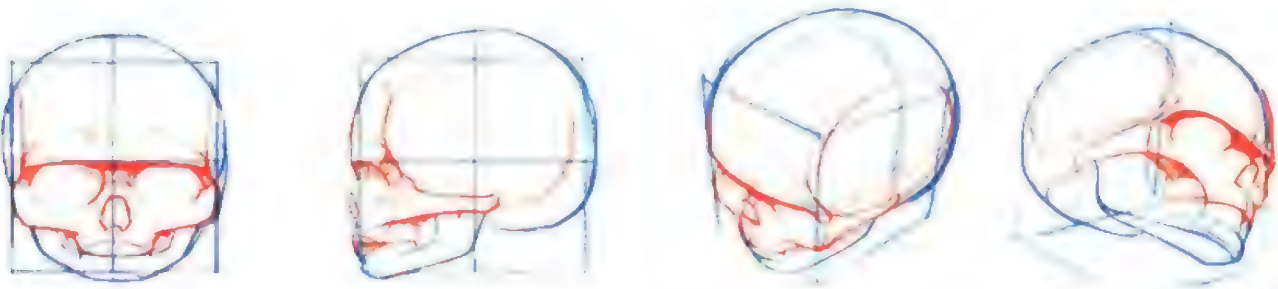
The perspective drawing of the cube body is very important. To better shape the face, we need to pyramid the face in detail on the cross line of the cube body.



Pyramid the face structure on the cube body, and the face structure is more accurate.



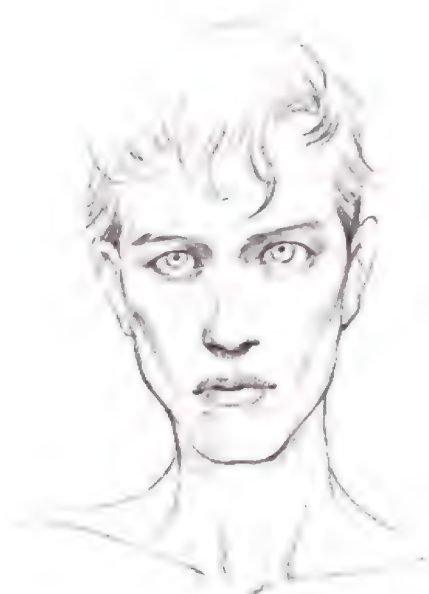
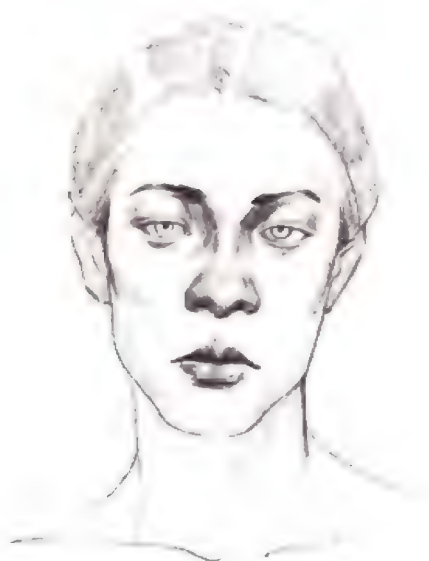
Pyramid the face structure on the cube body, and the face structure is more accurate.



Pyramid the face structure on the cube body, and the face structure is more accurate.

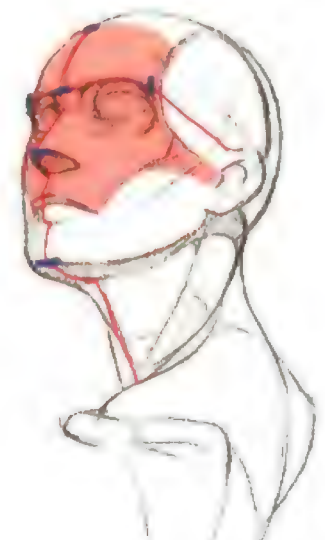
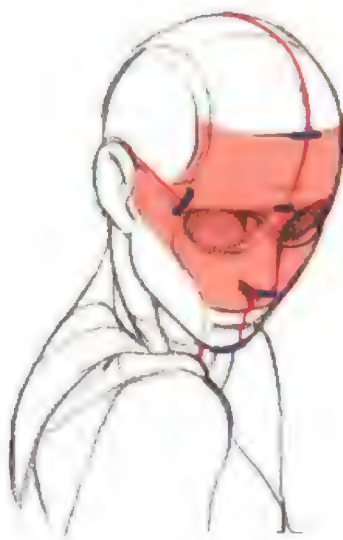
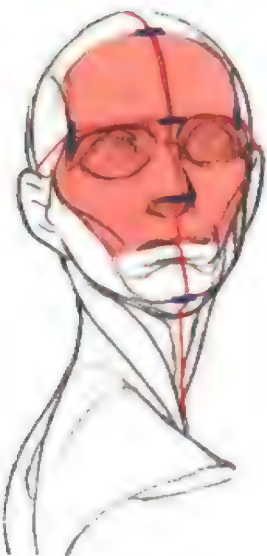
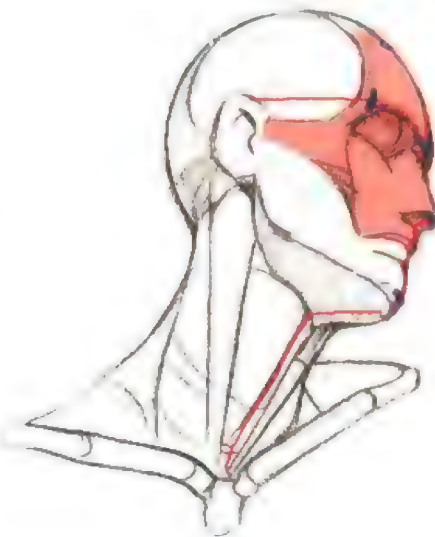
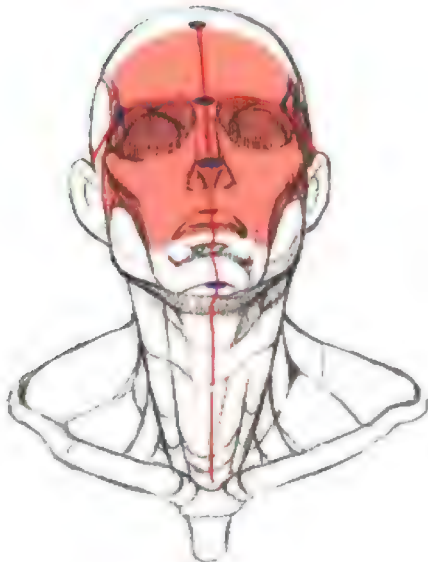
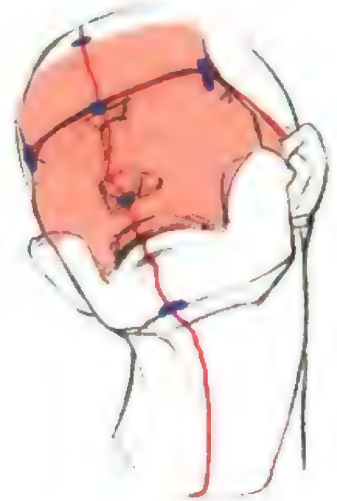
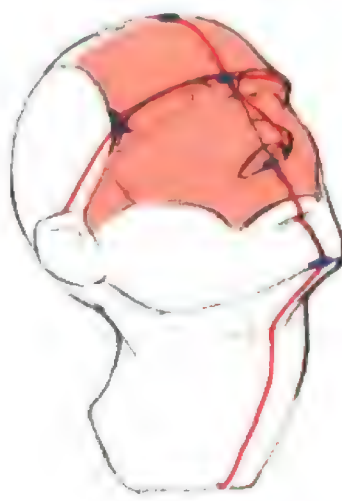
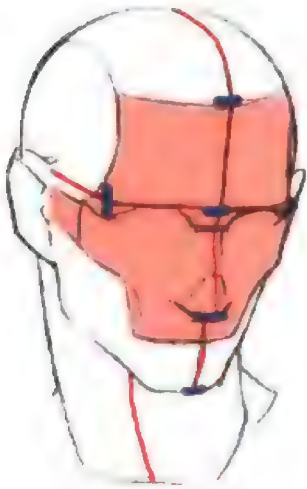


In real life, the facial bones of different characters affect how we feel about their facial features.

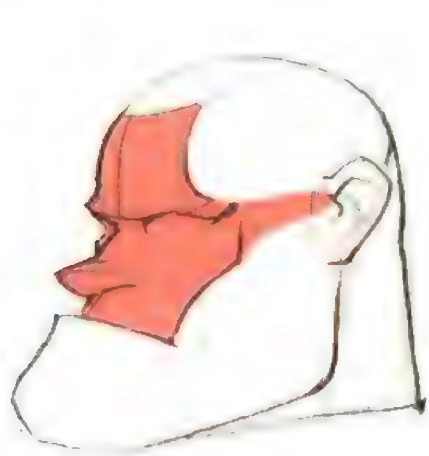


These drawings illustrate the location of the major muscles of the head and neck. The location of the muscles is indicated by the red lines and the location of the bones by the black lines.

The location.



The shape and size of the faces of anime characters are relatively captured. We make good use of different facial features to show different secured faces of anime characters in different gods effect.



06

Facial features of the same character from different angles

This section will introduce how to practice portraying the facial features of the same character from different angles.

01

Draw the flat shape of the character's face.



02

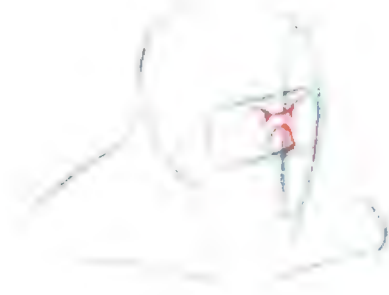
Mark it on the basis of the plane shape.

The aspect ratio of the head is 1:1.5.

When the meaning is marked, the word "medium" is used.

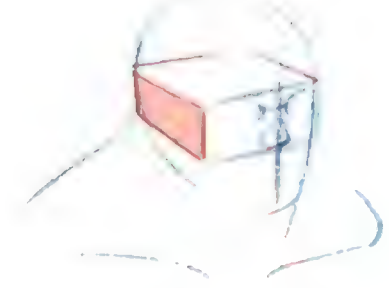
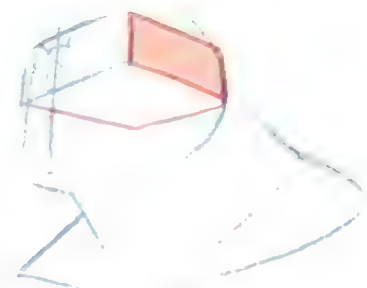
The aspect ratio should be 1:1.5.





03

In the original area of the word "middle", find the structure of the eyebrow center, similar to the letter "H". Then find the triangular area of the nasal bone under the center of the eyebrow.



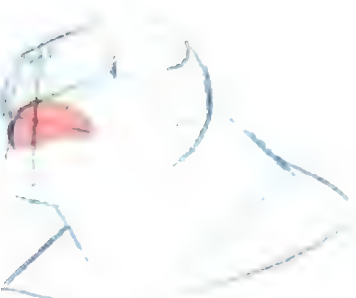
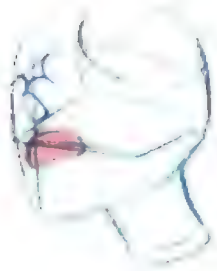
04

Shape a rectangular block that represents the thickness of the entire head within the area of the word "middle", a bit like a brick being inlaid in the head.



05

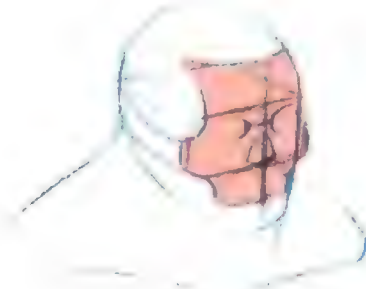
Draw a circle representing the bow bone. This circle can help us determine the specific location of the turning point of the bow bone.



06

Hope to build the oral cavity and control the size of the oral cavity at all angles





07

Connect the facial structure of the character to form a "mask", and pay attention to ensure that the characteristics of the "mask" are the same from all angles



08

Mark the position of the chin area, and control the size of the chin at different angles, and don't draw it too large or too small.



09

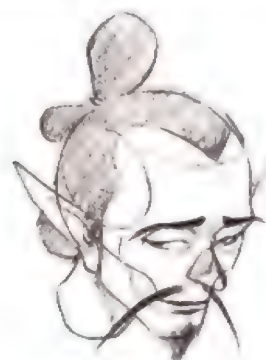
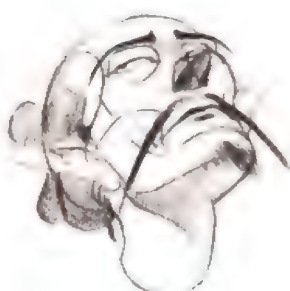
Remember the overall shape and proportions of the character. This is still a very simple sketch of the character's head features, so be generous when



10

Portray the facial features of the character, draw ears, nose, eyebrows, beard, etc.





11

To portray the character's hairstyle in a flat state, pay attention to the changes in the hairstyle from all angles. Then roughly outline the lines on the character's clothes.



12

Perfecting the details of the character, the facial features of the same character from different angles are depicted.

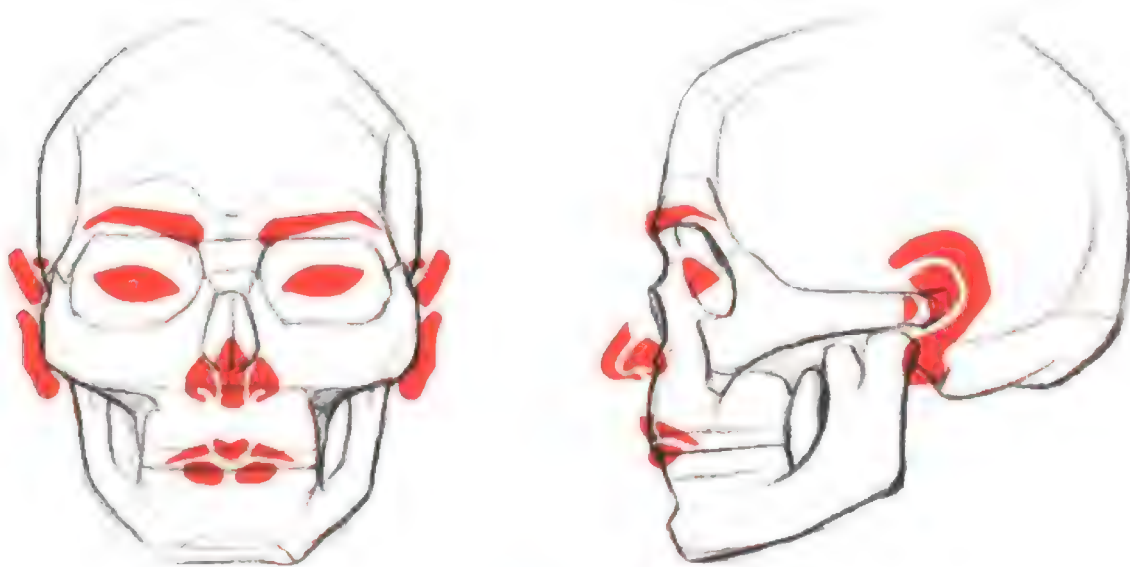
07

Shaping of facial features :

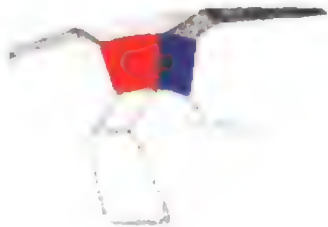
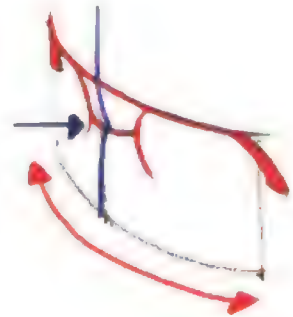
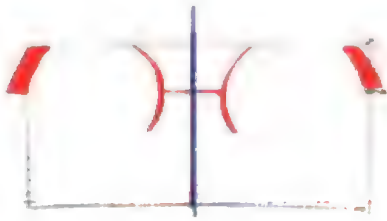
The most important thing to draw the facial features is to find the corresponding position of the facial features on the head bone road, and to accurately draw the perspective relationship of the facial features through the spatial performance between them.

Shaping the ups and downs of the facial bones is a very critical step. As long as the ups and downs of the facial bones are shaped well, it will be very easy to draw the facial features on this basis.

When shaping the facial features, pay attention to the perspective relationship between the small "H" and the triangle area at different angles.



When drawing the eyebrows, we should make the eyebrow arch bone and the eyebrow center very clear. At the same time, we need to pay attention to the perspective of the eyebrows. The eyebrows should be drawn in a three-dimensional perspective.



When shaping the center of the eyebrow, we can think of it as an angle. When drawing anime characters, this clip

The angle processing will be relatively weak, so we have to make it three-dimensional when painting.

After painting the eyebrow arch bone and eyebrow center, it will be very easy to draw the eyebrows and eyes.

Many people are very casual when shaping their eyebrows, but eyebrows are very important for expressing facial features, so pay attention to them. The eyebrows conform to the solidity of the eyebrow arch bone, and the perspective relationship of the eyebrows is accurately drawn.



The eyebrows are the most expressive part of the face. They can show a wide range of emotions, from happiness to sadness. The eyebrows are also a key part of the face's structure, and they can be used to create a variety of different looks.

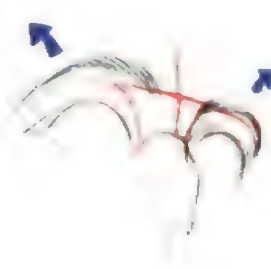
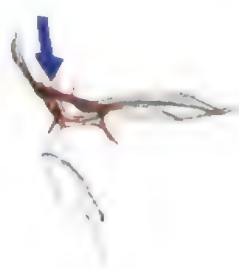


The eyebrow characteristics of different characters are also different. We can change the eyebrows' eyebrow body and eyebrow groove to make the eyebrows show different characteristics.

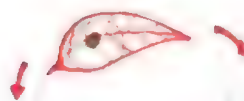
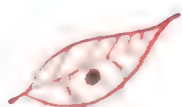
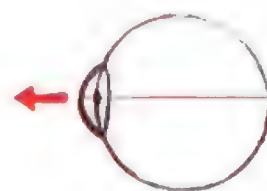


The eyebrows are a very difficult part to draw, and they can be used to express a wide range of emotions. The eyebrows are also a key part of the face's structure, and they can be used to create a variety of different looks.

In this way, the emotions of the characters can be expressed in place.



The structure of the eye can be simply understood as a combination of three relatively simple and easy-to-understand forms: sphere, leaf, and eyeball.



The pupils will protrude slightly, I
We show the ups and downs on the
pupils well, for an easier direction of
Eyes.



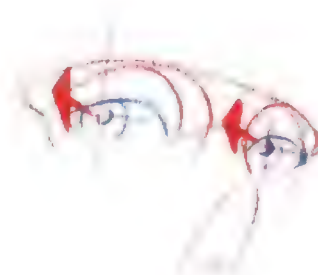
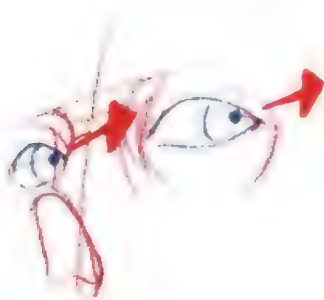
Let the leaves and eyes combine,
In this way, you can quickly draw a stand-up
Somatosensory eyes.



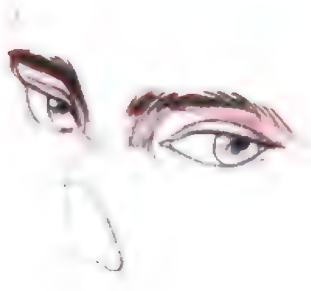
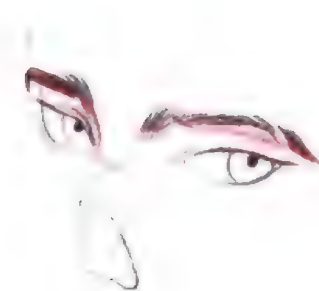
Combine the above steps, you can
To create eyes with different orientations.



The skewed eyes can make the eyes appear more agile. If the nose of your face and eyes cannot meet at one point, it will appear as if the eyes are completely skewed.



The next step is to put in the pupils and the eyelids. The pupils should be drawn in a way that they are not perfectly round, but slightly elongated. The eyelids should be drawn in a way that they are not perfectly straight, but slightly curved. Draw the shape of the eyebrows and the perspective state of the nose, and shape the trend of the eyebrows and the details of the eyes on this basis. After this step, we'll make the whole eyes appear more three-dimensional and fully go. After dropping the sketch, I got a pair of more three-dimensional eyes.

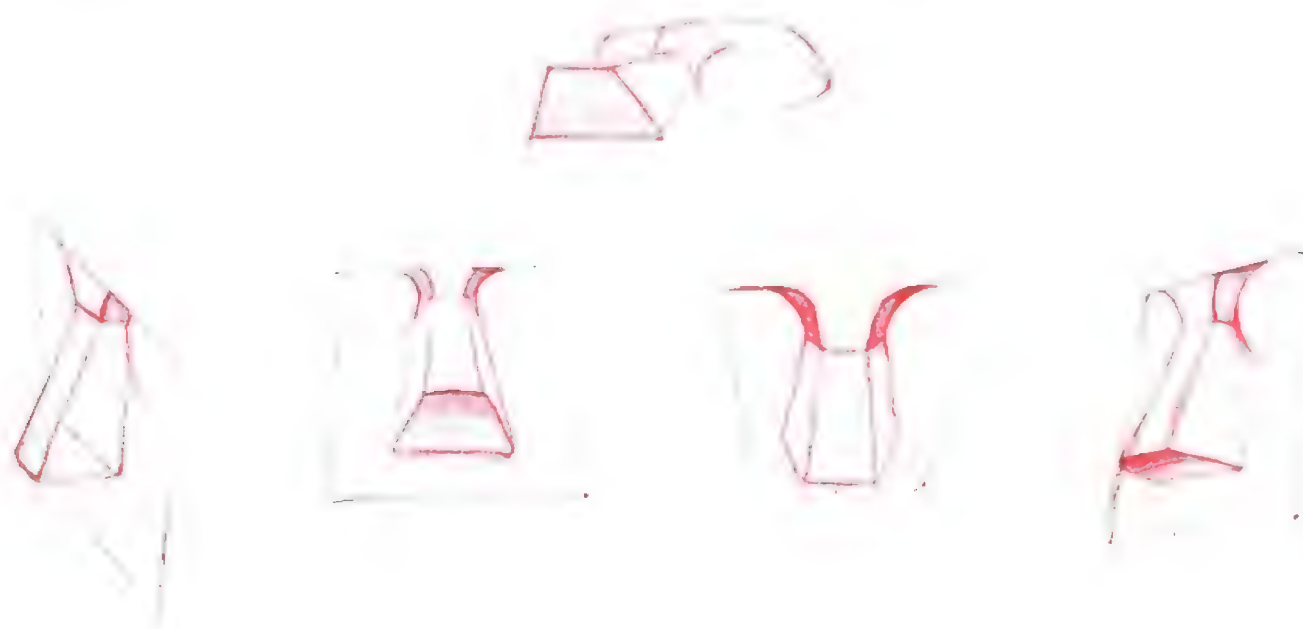


We can also observe the characters or photos in our lives, and look at the eyes in different orientations, which helps us to portray them in the subsequent shaping of the eyes.
Give a more vivid look.

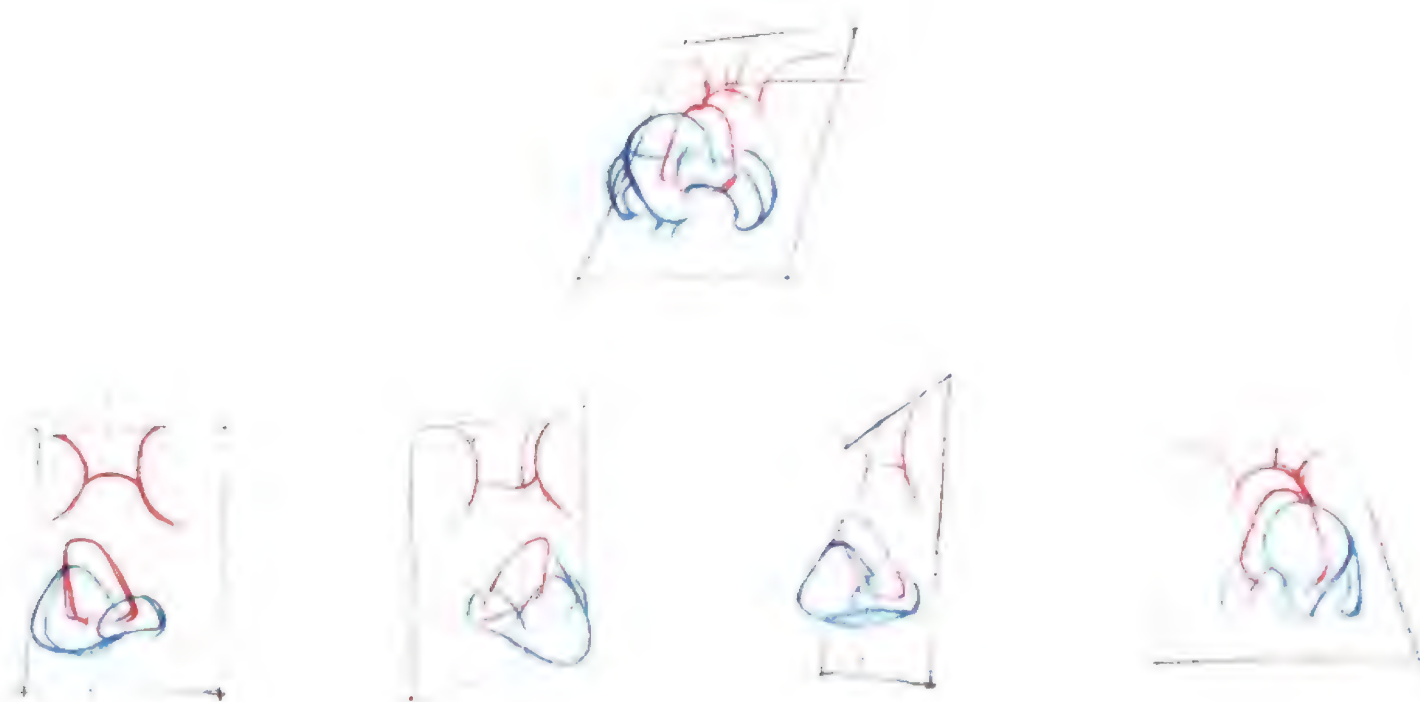


We can think of the nose as a trapezoid, with a rectangular plane under the trapezoid.

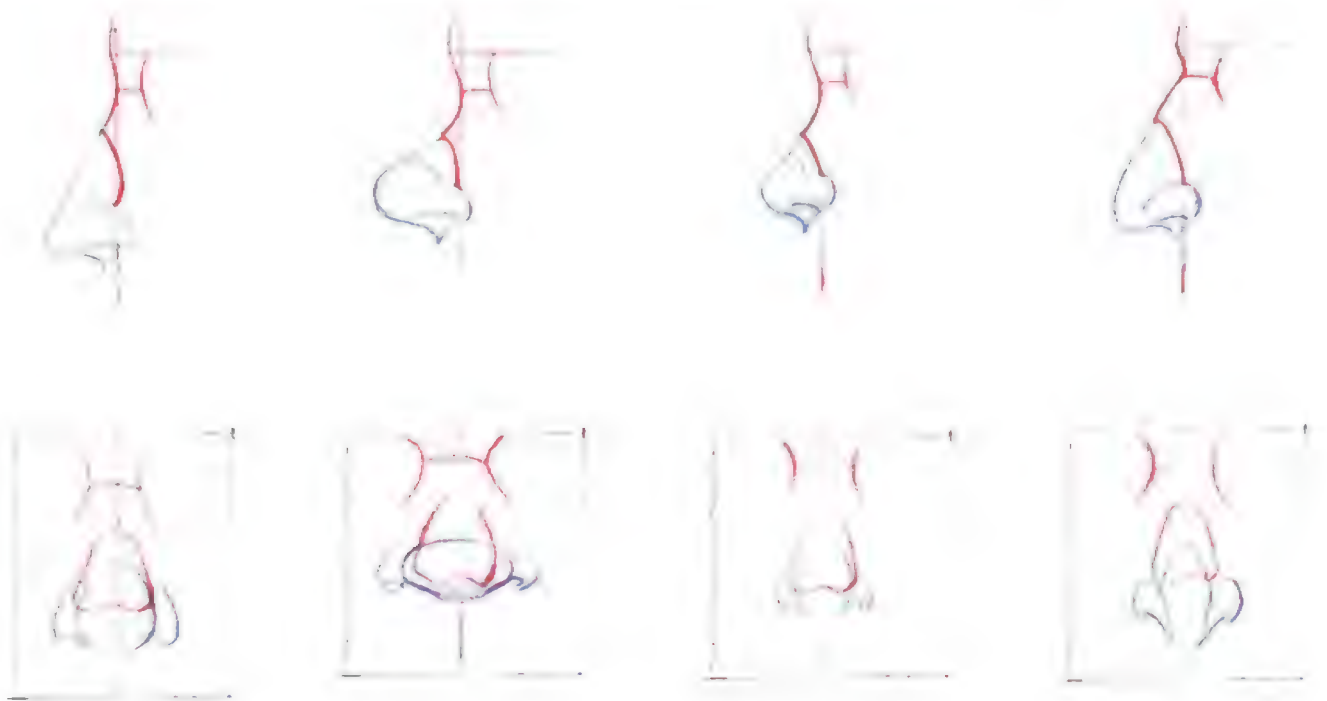
Combining the trapezoid with the rectangular plane of the face, we can easily draw the perspective state of the nose at different angles.



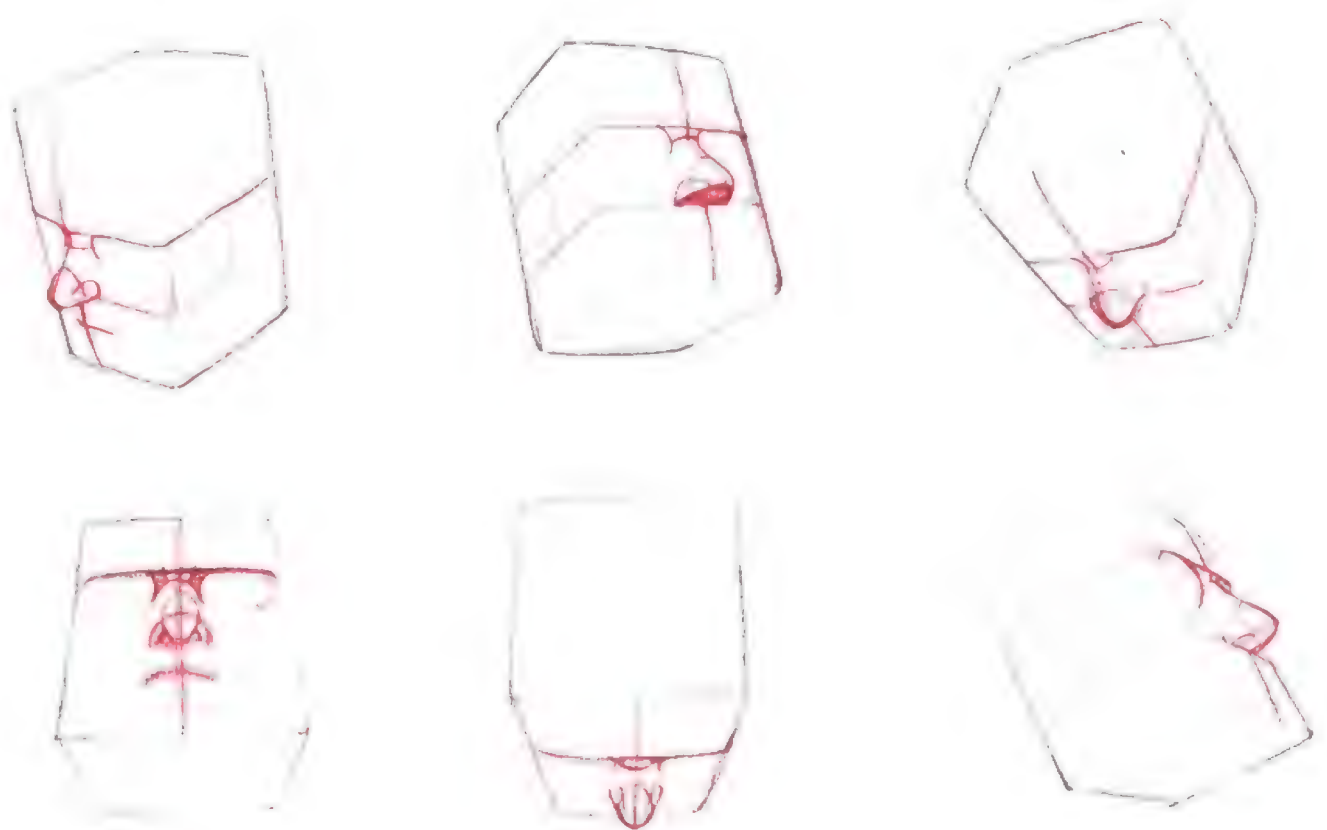
The most critical principle shaping the nose is the nose. The nose is divided into the tip of the nose and the nose. If we can master the principle of plotting it like the nose and the nose in the previous trapezoidal state, then we can shape the nose. The nose will appear more real.



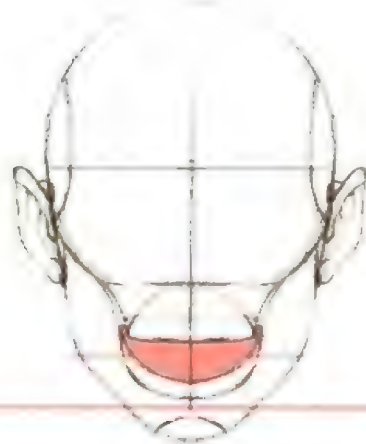
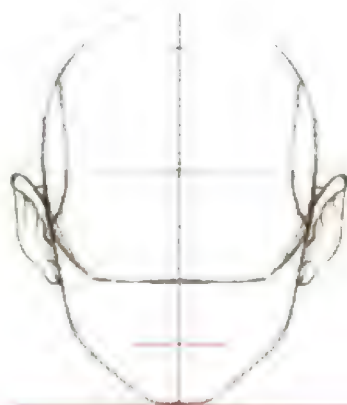
4 The noses of different characters have different shapes. By cleverly using the structure to grasp the shape of the nose, we can draw noses with different morphologies.



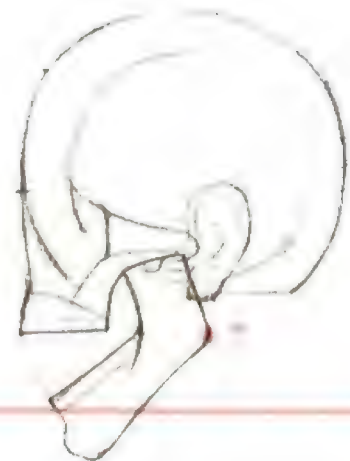
4 Noses with different orientations will also have different morphological changes. Mastering the laws will make it easier for us to shape our noses later.



The mouth is a part that is easier to ignore. Points, we often make anime characters simple. Turn your mouth. We have to understand before simplifying. The state of the mouth after opening, and its effect on the face—the lower dental part. There will be obvious changes, and the face shape will be lengthened.



From the side, when the mouth is closed. When the length is relatively normal, after opening. The open part has a certain degree of solitude, backward and down. The trajectory of Fang's movement is also an arc.



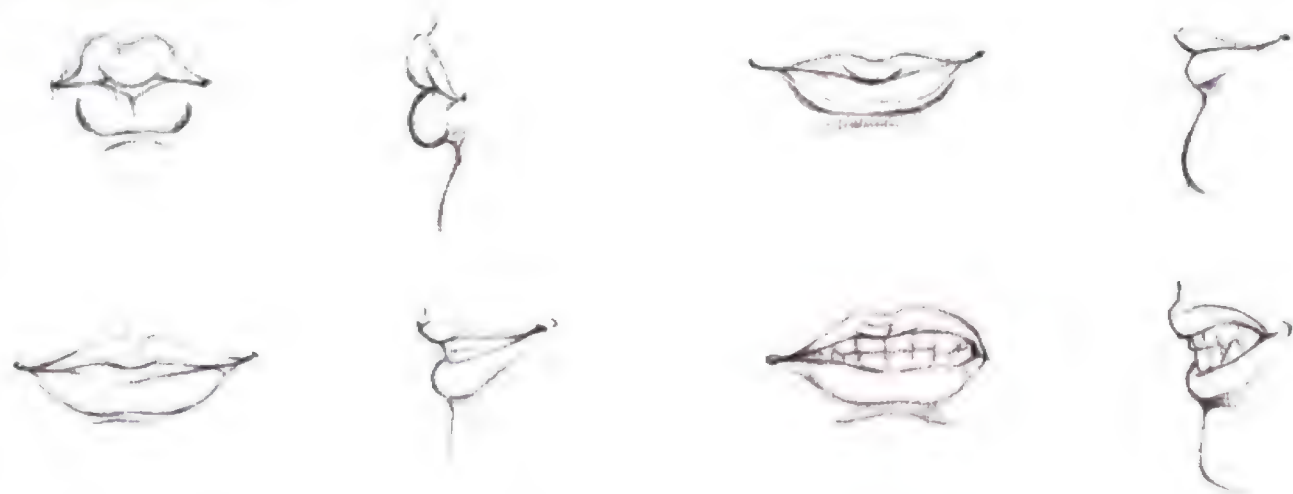
In the perspective state of the picture on the right, put the mouth layer is painted, so the mouth is shaped like this. Only then can there be a certain sense of three-dimensional and space.



Observing the mouth structure of the human body from the side, the front and the back, the top and the bottom, the left and the right, the mouth is a very important part of the human body.



The mouth is a very important part that we use to express and communicate, and it can show different states under different circumstances. When drawing the mouth, we should pay attention to the position of the corners, the mouth and the specific shape of the seam and line.

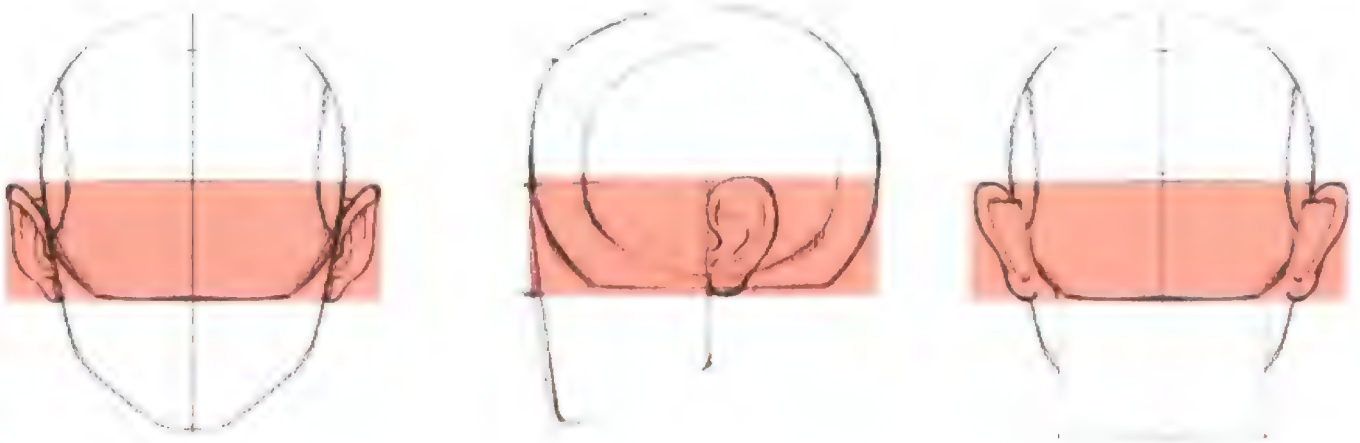


We want to observe the shape of the mouth and the position of the mouth in the following primary perspective view, then draw the correct perspective shape of the upper and lower lips.

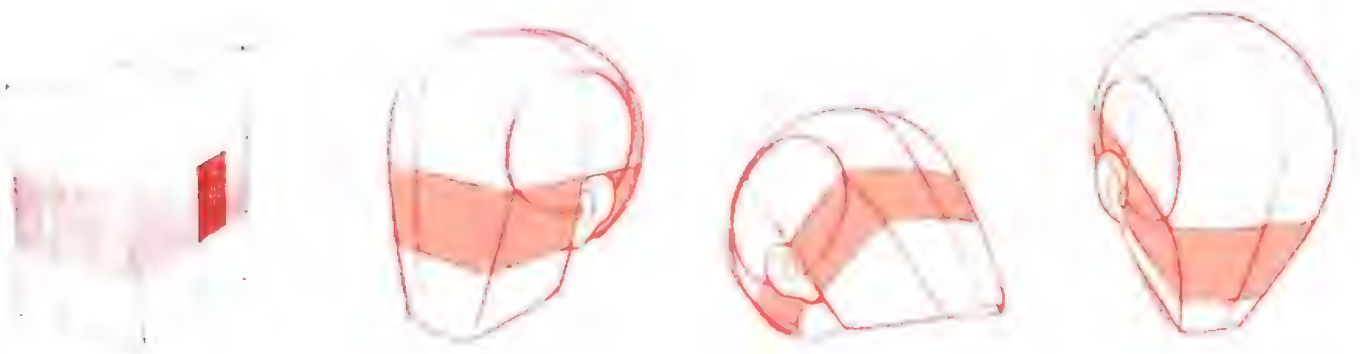


On the basis of the above, we can observe the shape of the mouth and the position of the mouth in the following primary perspective view, then draw the correct perspective shape of the upper and lower lips.





The ears are located in the important facial area from the eyebrow arch bone to the bottom of the nose



As can be seen from the circle, the starting point of the ear is centered behind the side. As long as we can show the perspective of the circle well, we can quickly find the specific points under different perspectives location.



The shape of the ear is like a slightly opened door, protruding slightly outward from the plane on the positive side

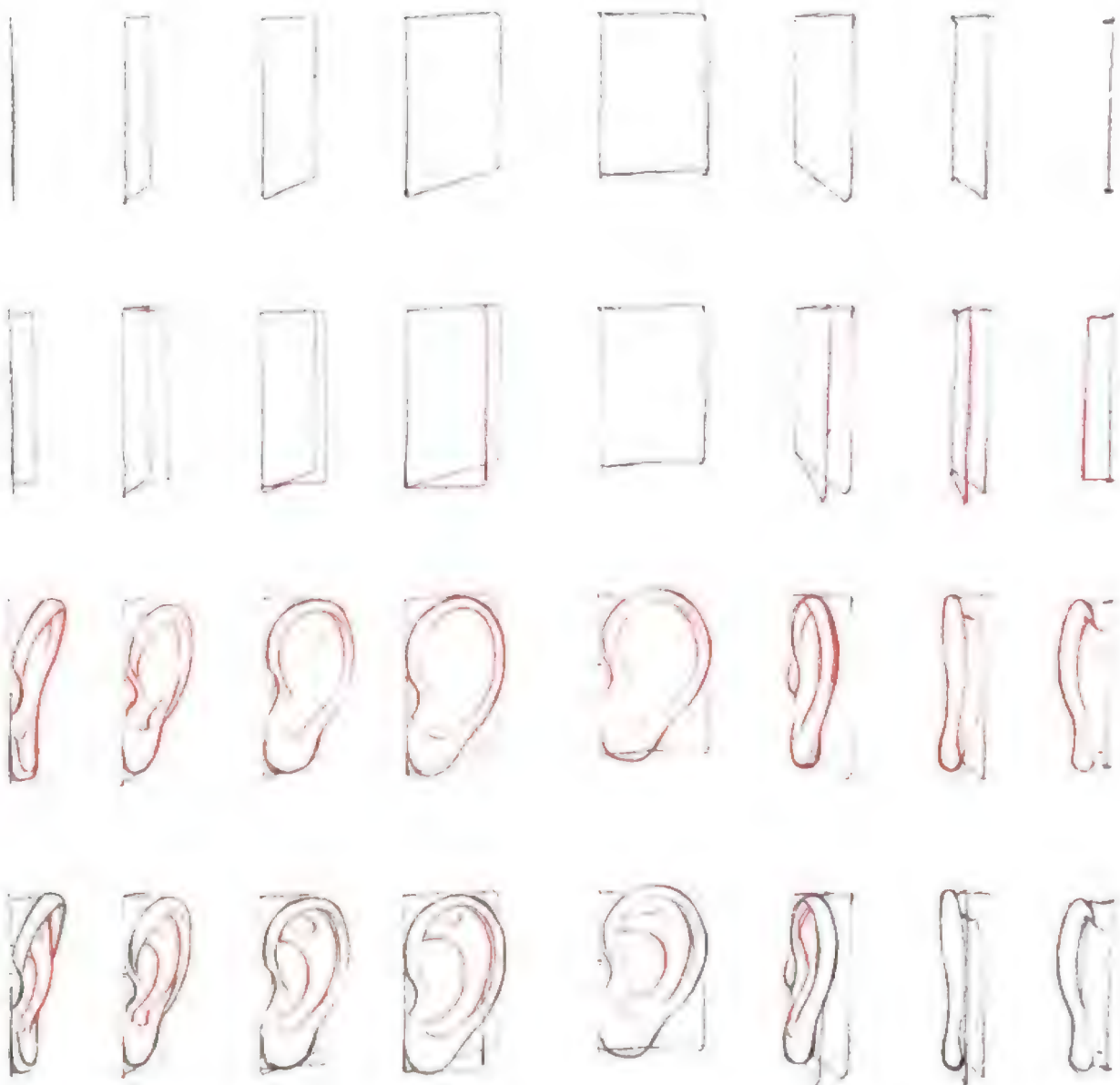


When shading the ears, you can first determine a face, and then draw an open door. On the basis of this door, the outer contour of the ear is shaped, and then some details inside the ear are shaded.

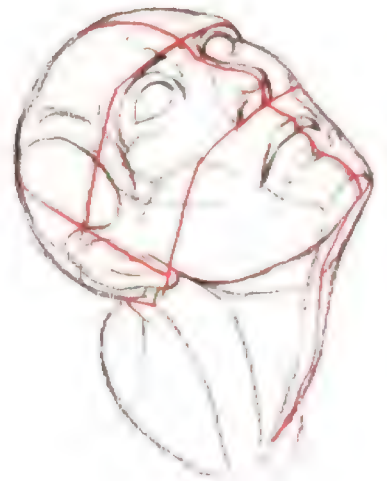
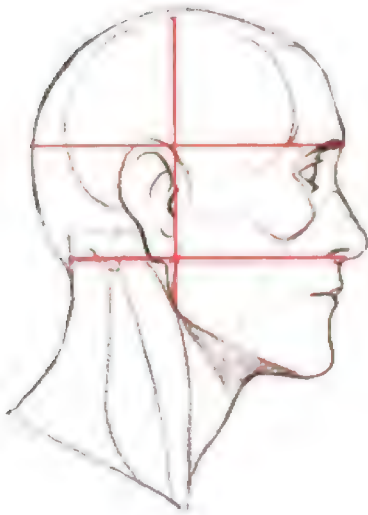
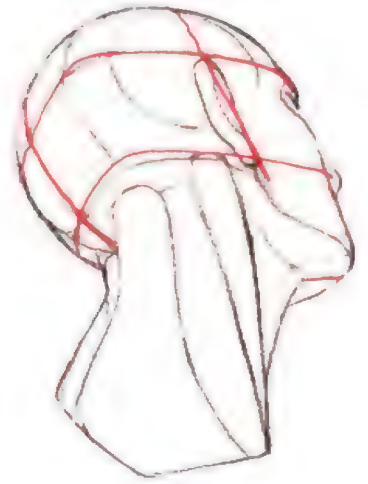
Small structure



In order to better shape the ears, we can draw doors with different angles, and draw the perspective of the ears with different angles in these doors.



After we have an understanding of the relevant knowledge of shaping the five parts, we can try to combine the abdominal mesh and muscles to arrange the five parts of the head.

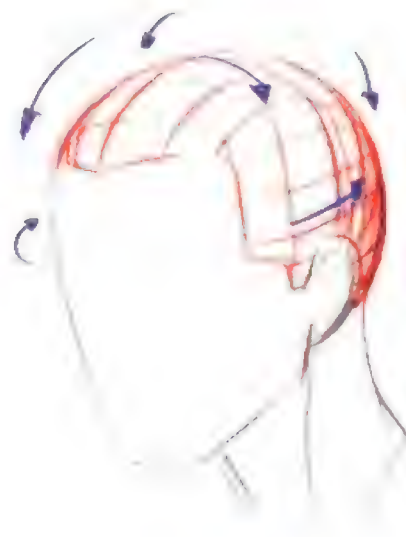


08

Hair shaping :

Before shaping the hair, we can divide the area of the hair. It is divided into three parts: front, middle and back. Pay attention when shaping. It is intended to express the ups and downs of the hair, making it similar to the sutra on the globe. Knot line.

When shaping hair, we have to analyze the hairline. In the position The reason why we can draw different hair Somatosensory is all due to the cognition of the turning point of the head.

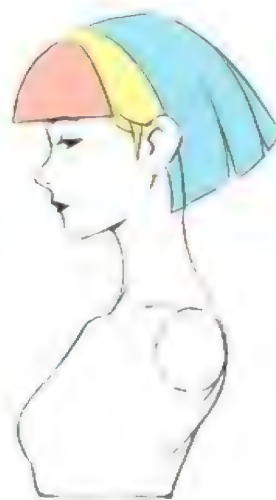
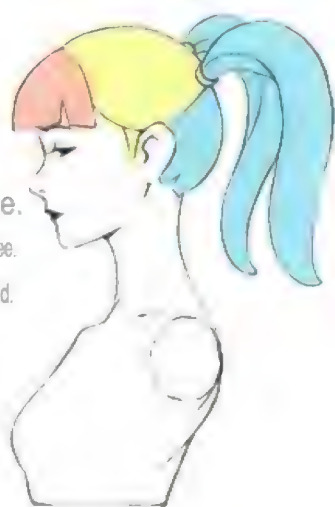


When styling hair, we.

Try to change the first, middle, and last three.

[The shape of the area can be combined.

Different hairstyles.



In order to make the hairstyle more

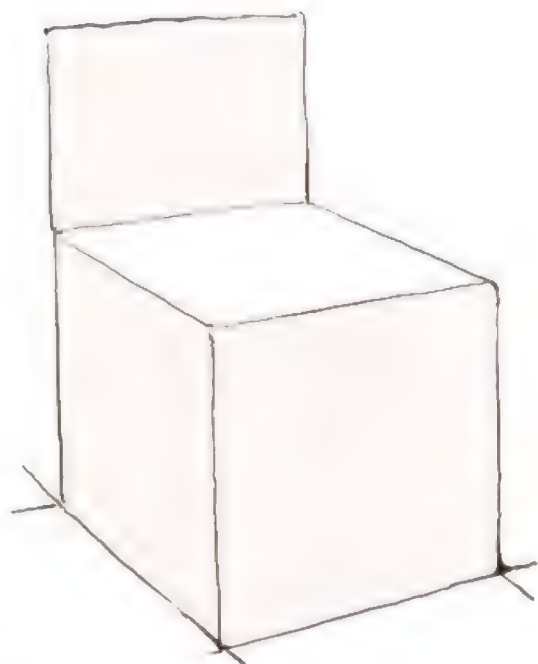
Rich, we can be in the hair. Add
some small hair pieces interspersed.



Check again on the basis of if Line, pay
attention to the trend of the hair to be physical Now
the three-dimensional sense of the head.

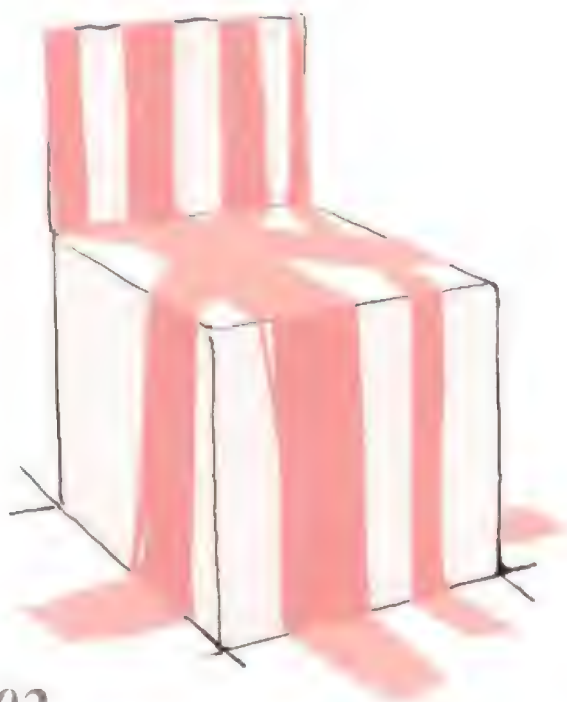


◆ Hair grouping exercises



01

Draw the structure of the chair. Determine the position of the object.



02

Draw the hair on the back of the chair. Add the hair to the back of the chair. The hair is drawn in a vertical direction.



03

Use the hair on the back of the chair to determine the position of the hair. The hair is drawn in a vertical direction.



04

Shade the shadow inside the hair to make the three-dimensional sense of the hair more obvious. Such exercises can help everyone better clarify the relationship between hair and objects.



Hair is like strips of noodles. When painting, pay attention to the transparency of the noodles.

Depending on the state

Complex hair is composed of a combination of multiple facets, and the perspective relationship of each facet is. After straightening, divide the interior and deal with the interspersed lines in the hair, so that you can be more. Add a clear picture of the combination form of hair.



Combining several sets of facial pieces with turning points can make the painted hair produce a richer combination effect.

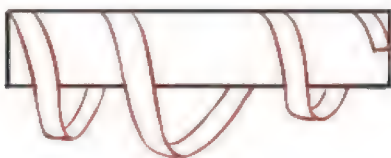
When a variety of facial slices with turning changes are combined together, the resulting hair combination will produce a spiral effect.



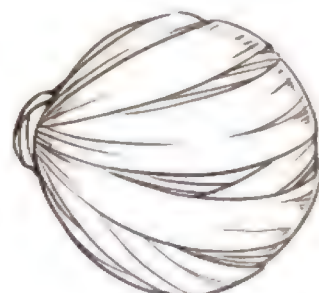
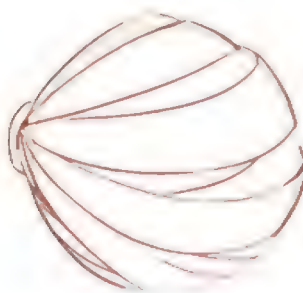
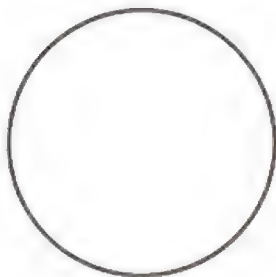
To reflect the three-dimensional sense of hair, we can still think of it as a face piece. When it comes into contact with different objects, it will produce different turning points.



The face piece is purely wound around the wooden roots and will be spiral. When the wooden roots are drawn out of the face piece, the shade of the face piece will change due to gravity. In this case, the inside of the hair will be divided. Drawing the lines interspersed with local details, you get a set of spiral curly hair.



Place the wooden stick around the hair horizontally. At this time, the hair under the wooden root will grow due to gravity. Referring to these details, we can better see the texture of the hair.



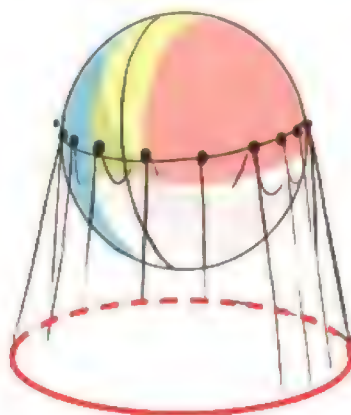
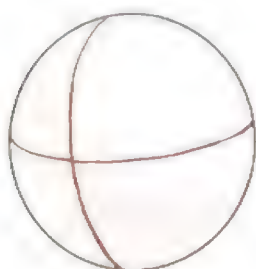
Coiled the hair on the sphere, the hair will appear to shrink around each other.

When shaping hair, we can first plant the general shade of the hair, grow the face pieces on the basis of the general shade and add interspersed lines that reflect the density. This

This makes it easier to draw the three-dimensional sense of hair.

Hair is shaped step by step from simple shapes. We first simplify the large shape of the hair, and then gradually add small facets to combine, and portray the three-dimensional sense of the other facets in place. In this way, we can better draw the sense of space of the hair.

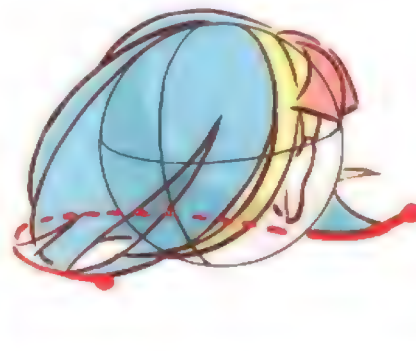
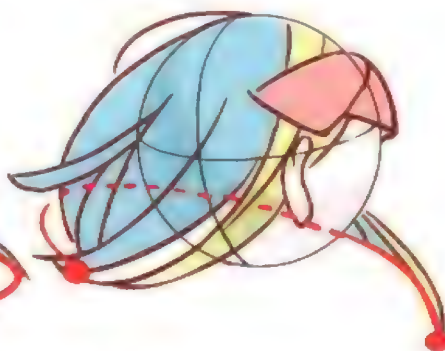
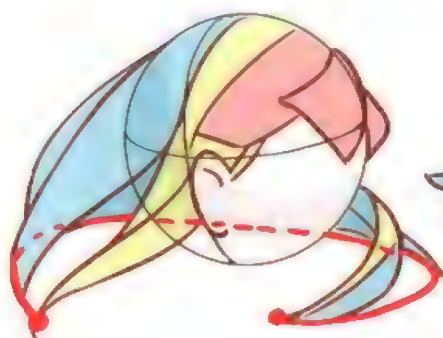




The human head is like a sphere, and the hair is like gauze covering the sphere. When we shape our hair, we should pay attention to the contact points between the gauze and the sphere. They will be based on the shape of the sphere. The state produces dense changes, which affect the turning and grouping of hair.



By dividing the front, middle and back areas of the hair, we cut the gauze, cut out the conventional hairstyle, and then try to draw the effect of the hair fluttering on this basis. Here Pay attention to the ring structure of the hair.



When the head is rotating, we cannot look at the changes of each hair individually, but we need to see the ring structure clearly as a whole and understand its changes when the head is rotating. Draw it like this. The hair does not look broken.



When the hair is twisting, we can show different states of twist in the front, middle and back parts respectively. Pay attention to the appearance of different hairstyles when twisting.

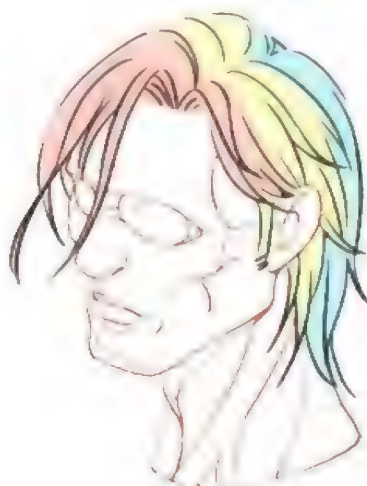
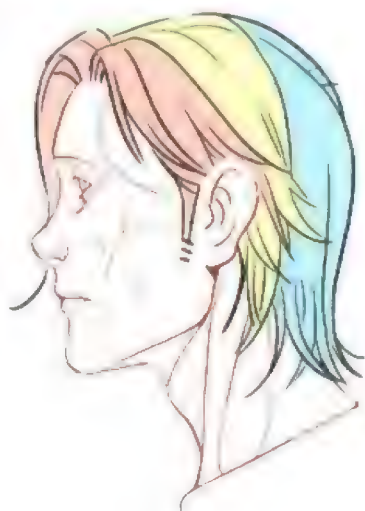
The state is different.

12

When drawing different figures, we can use the same hair styles and models, drawing at the direction of the muscles in different poses, and consider the density and scientific sense of the same style.
The hair style is a very important part of the figure drawing, and it should be drawn in a way that is both beautiful and realistic.



When making the same hairstyle from different angles, we should remember several sets of key lines in the front, middle, and back areas, and use the unity of these lines to draw no. The same hairstyle at the same angle.



After we are familiar with the three-dimensional relationship of the head, when we shade our hair, we must let the hair change along the shape of the head. From different angles, the same hairstyle will appear in different states.



If we want to draw a realistic hairstyle, we can refer to the photos for practice. When arranging the tone, we can try to follow the trend of the hair.



09

Facial muscles and expressions

The intermuscular muscles of the face are more complex. In order to easily remember, we can divide them into two areas: dynamic and static. The muscles in the motor area are mainly concentrated

Around the brows, eyes, and mouth (rotator muscles), the movement of these muscles can easily make people feel the changes in the expressions of the characters. The muscles in the static area will also be due to

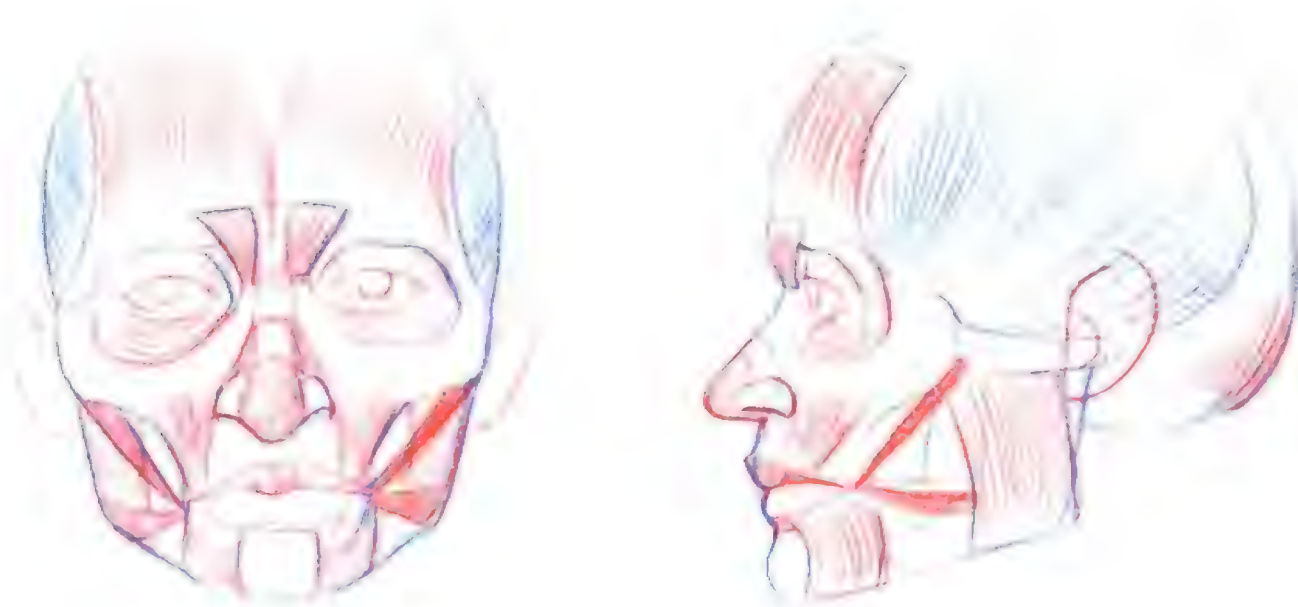
Movement is generated for some actions, but the amplitude is not very large, and it has little effect on the expressions of the characters.



We have a certain understanding of the facial muscles, so that when we draw the face, we can better express the ups and downs of the light and dark tone.



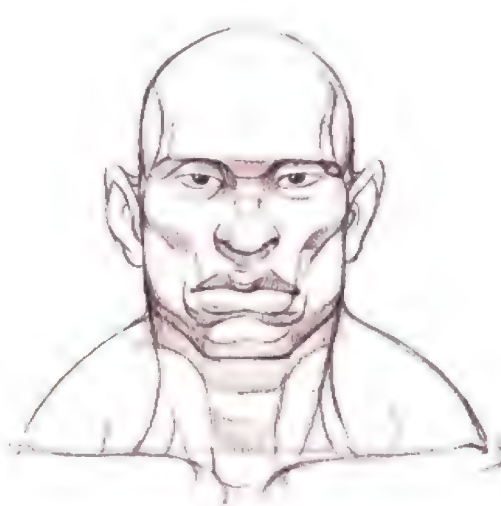
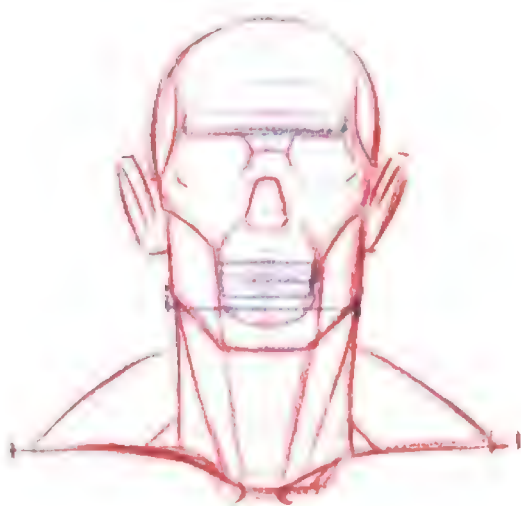
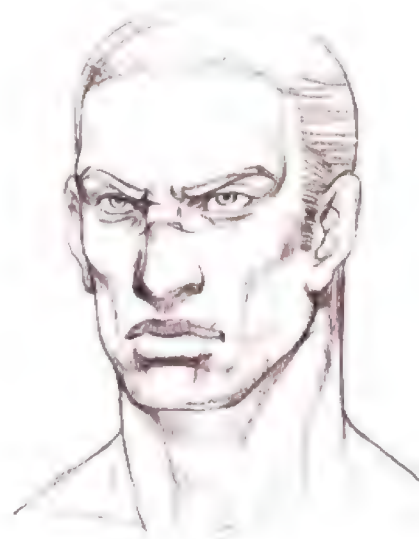
The relationship between the facial brackets and proportions of the characters is not static. We must learn to use the proportional changes of the facial brackets to fit their size when sketching the facial muscles.



After understanding the general division of the facial muscles of the characters, we should be able to understand the distribution of facial muscles in characters of different ages and genders.



The difference between the facial stents of men and women is mainly manifested in the size of the forehead and the corners of the face, such as the facial muscles of the mouth wheel. Compared to women, men's forehead is wider, the nuclear corners of the face are more distinct, and the area of the facial muscles of the mouth wheel is larger.



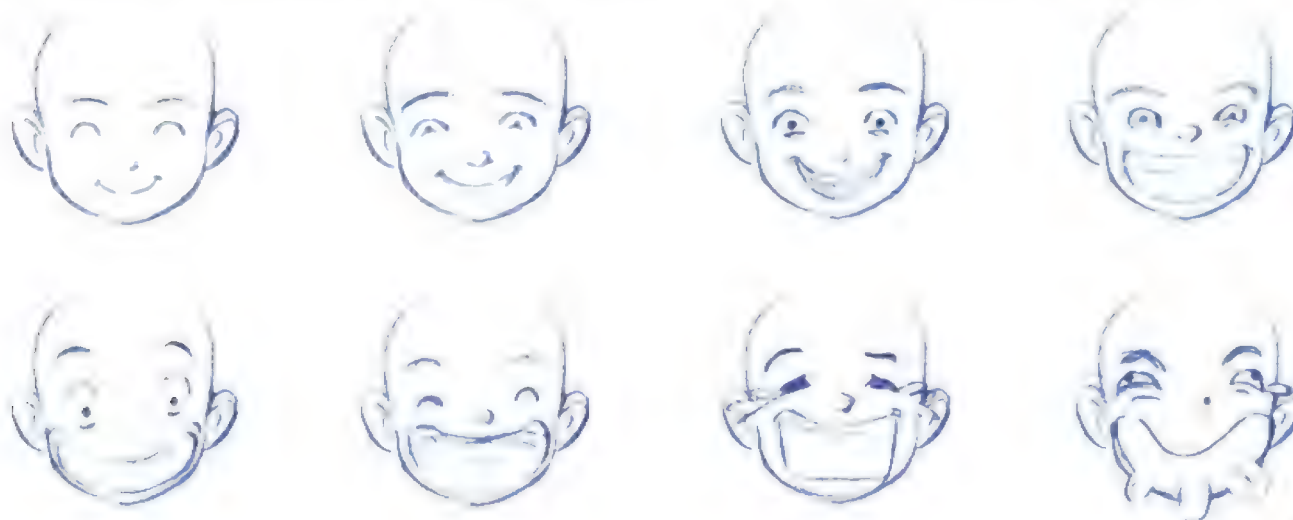
The main purpose of our understanding of facial muscles is to better shape different expressions on a character's face.



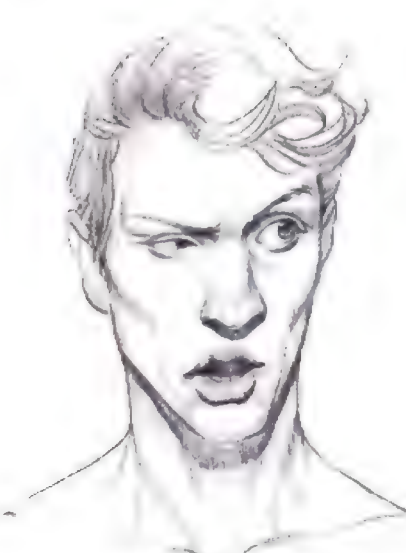
We can think of the facial features as symbols and try to make different combinations.



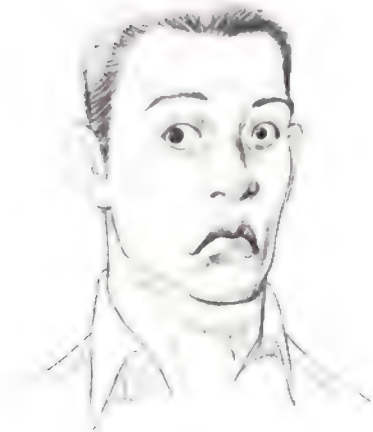
If we want to improve the richness of expressions, we can practice gradually exaggerating an expression. The following shows the effect of gradually exaggerating the 'laughing' expression.



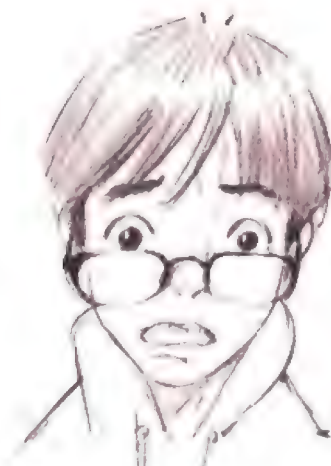
If we can't imagine vivid expressions, we can observe the appearance of people's facial features after making expressions in real life. When observing, after the content accumulated to a certain amount, we can draw these expressions in future creations.



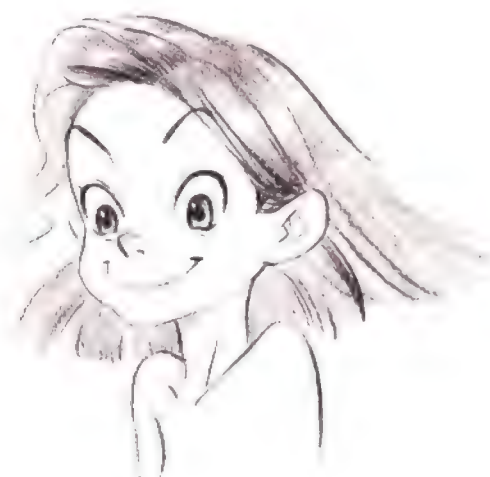
We will make a little proportional adjustment to the real expression, so that we can apply it well to anime characters.



If we want to draw the expressions vividly, we can try role-playing. When you want to portray the expression of a character, you can try to play the role first, and then draw it, this is a very effective way to draw a good expression.



When drawing, we can record some of the more memorable scenes in our daily lives, such as drawing the different expressions of different characters when they are in a happy mood.



10

Head drawing steps



01

Draw the head and shoulders with light, straight lines. Pay attention to the basic structure.



02

Outline with clear straight lines on the sketch.



03

Add more details on the details line.



04

Use a pencil to spread out the top.



05

Use paper towels to create a transition effect for the tone, so that the paper can better absorb lead powder.



06

On the basis of the previous step, the tone is further refined to make the relationship between light and dark of the tone more prominent.



07

Hope to create facial features and make the tone more harmonious.



08

Add a tone with small brushstrokes to form a natural transition with the previous tone, so that the overall tone is softer, and then the decorations of the face and head are painted.



When we draw a character, we don't need to draw every part of the character completely. We make appropriate trade-offs. Carefully drawing the key parts of the character can make the primary and secondary relationship more obvious.



11

Comprehensive exercises for the head

In addition to bones and muscles, the character's head usually has some decorations. We can observe the head decorations of different characters in life. You can also use photos to accumulate different head decoration elements, and arrange the accumulated content to the character's head through plane processing.



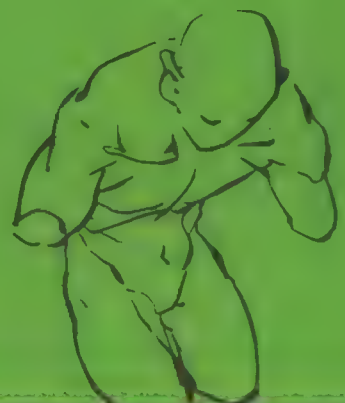
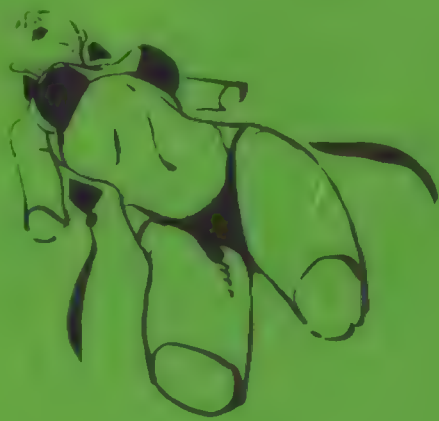
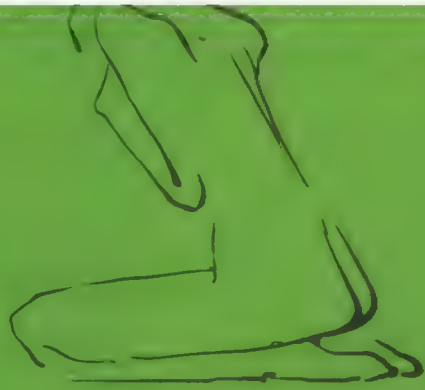


When we encounter a combination of elements we like very much, we can transform them into head decorations in a realistic style, draw them, and then slowly portray the details.









Chapter Three

Torso structure

第三章

躯干结构

01 躯干结构分析

02 脖子的结构

03 腹部的结构

04 胸部的结构

05 臀部的结构

06 肥胖的人和消瘦的人的躯干对比

07 躯干的结构步骤

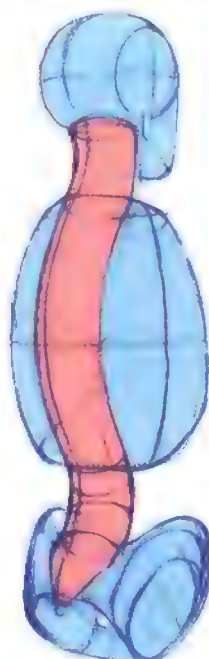
08 躯干的结构变化和运用的结构步骤

01

TORSO STRUCTURE DISASSEMBLY

人体躯干上的肌肉分布较多，我们在下方的三视图中可以看到肌肉的穿插关系较为复杂。

我们在绘制躯干的过程中，要注意脊柱这一非常重要的结构，掌握好脊柱的运动规律，整个躯干就可以很轻松地表现出来了。



The structure of the torso is more complicated, but we must simplify it appropriately when drawing it.



It is an anatomical drawing of the human torso.

With this drawing, you can understand the structure of the torso. Most is the first step in understanding the structure of the torso.



The torso is simplified and drawn in a simple way.

The shape of the torso is not the same as the anatomical drawing, and it dies out. The morphological changes mainly depend on the neck and



If you want to draw the torso, you can use the simple drawing.

However, you can still use the simple drawing to draw the torso.



We can use a cylinder and a sphere to represent the torso. The cylinder is closer to the true form of the torso, because the human body is generally round, and the cylinder is better.

Show the thickness of the repellent.



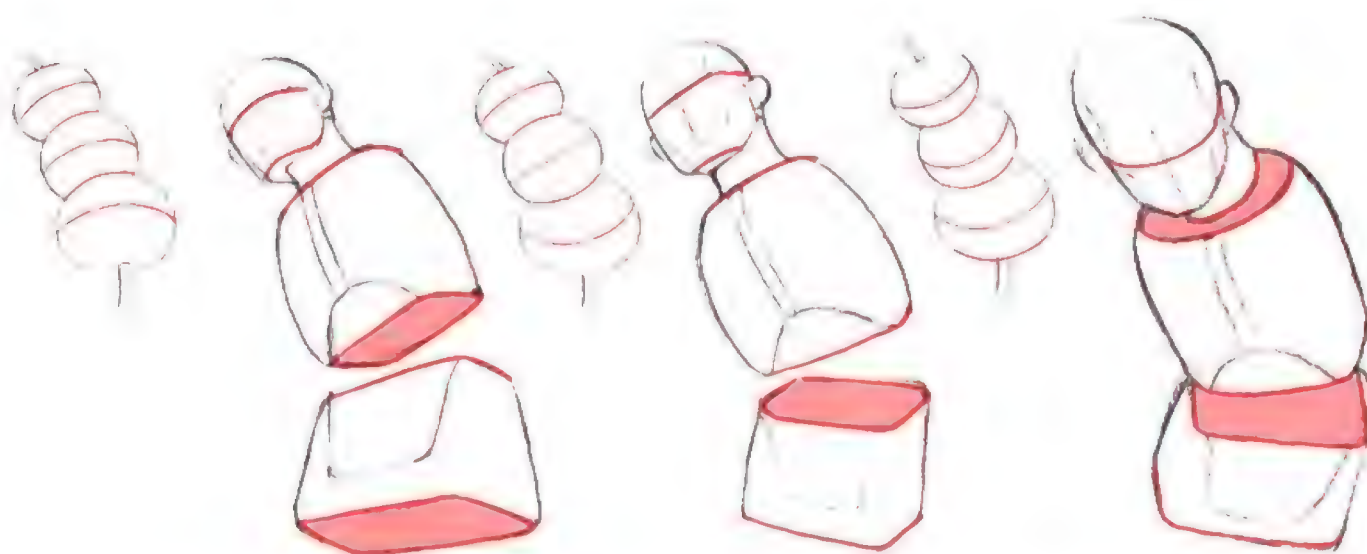
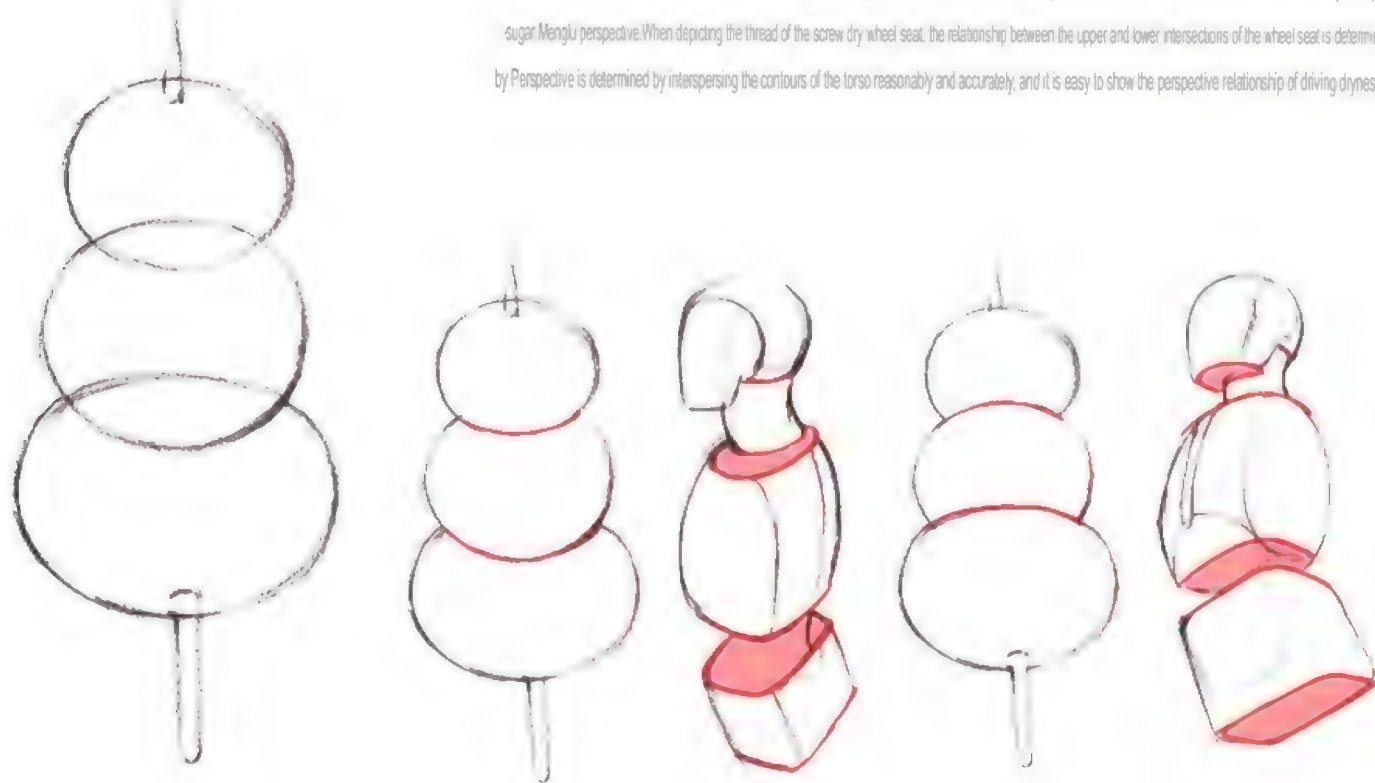
When we draw the torso, we need to pay attention to the shape of the neck and waist. According to the perspective, the dynamics of the arms and waist are well represented, and the torso composed of several geometric groups will appear more real.



When expressing the twisting state of the torso, we can put a ring on the torso. When the trunk is twisted, the ring will tilt at different angles. After holding this point, it is easy to draw the edge lines of the trunk to create a three-dimensional sense.



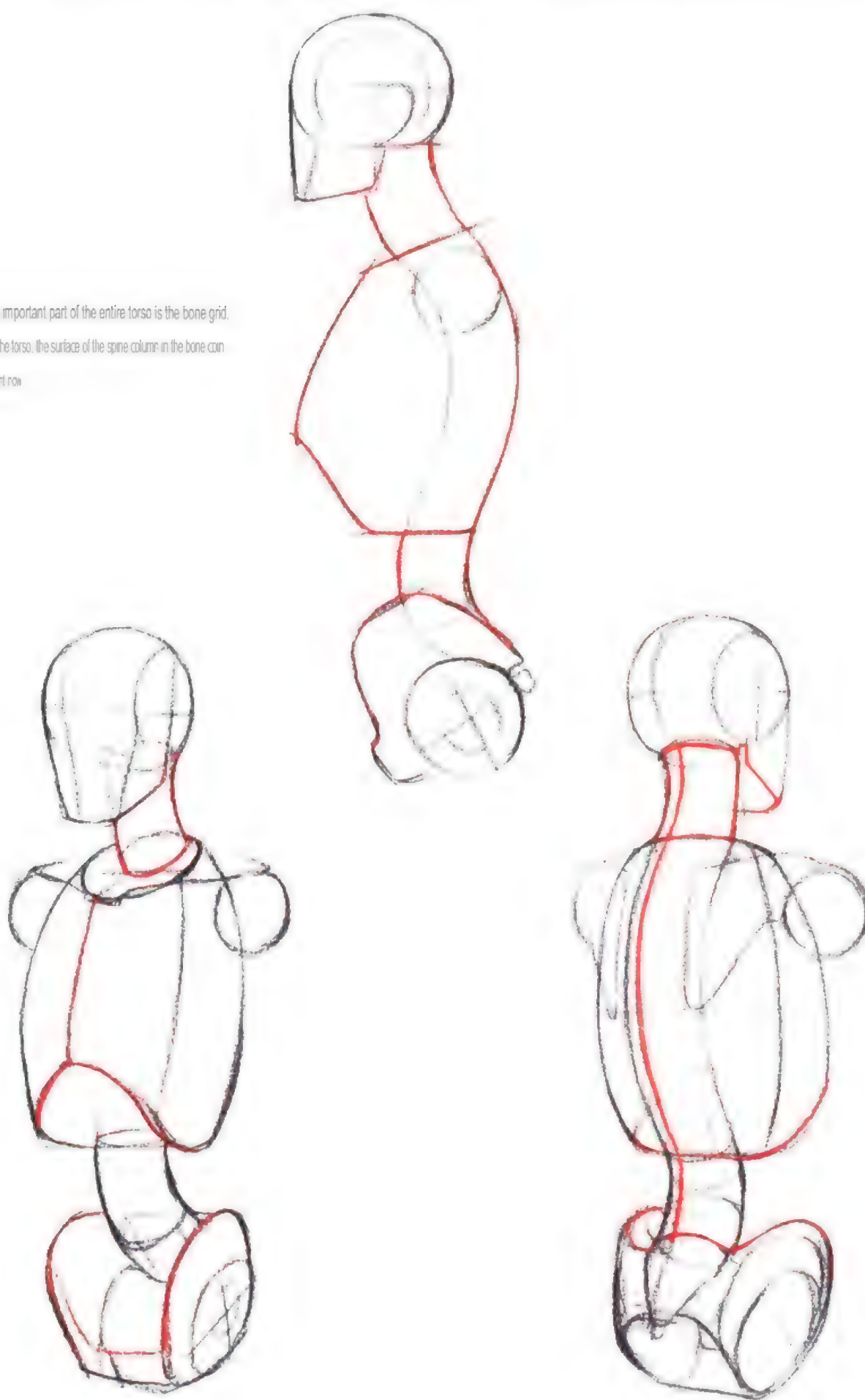
We can try to think of dried snails as sugar Mengli. When making dried snails, the perspective of many parts of the dried snails is made of this. It was decided by a simple sugar Mengli perspective. When depicting the thread of the screw dry wheel seat, the relationship between the upper and lower intersections of the wheel seat is determined by Perspective is determined by interspersing the contours of the torso reasonably and accurately, and it is easy to show the perspective relationship of driving dryness.



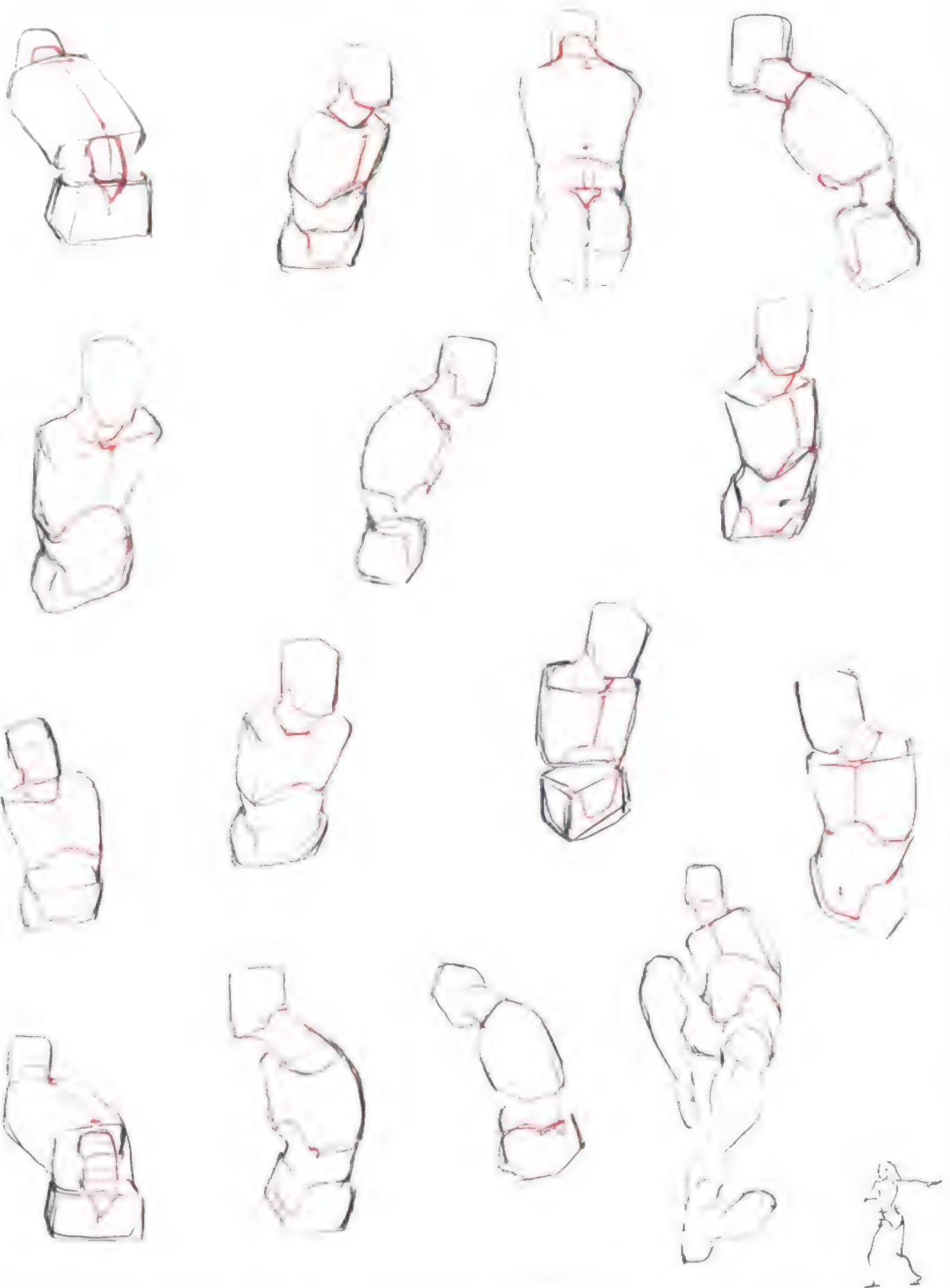
We can think of the sign of string sugar Mengli as the spine, but the spine will not be as straight as this sign when the human body is moving. When the spine is bent, we can cleverly use sugar Mengli. The curvature of the torso is used to shape the torso, provide an expression of the movement of the torso, and use the contours of the torso to express the state of movement of the torso, so as to make the movement more vivid.



The most important part of the entire torso is the bone grid.
And when we shape the torso, the surface of the spine column in the bone can
It is particularly important now



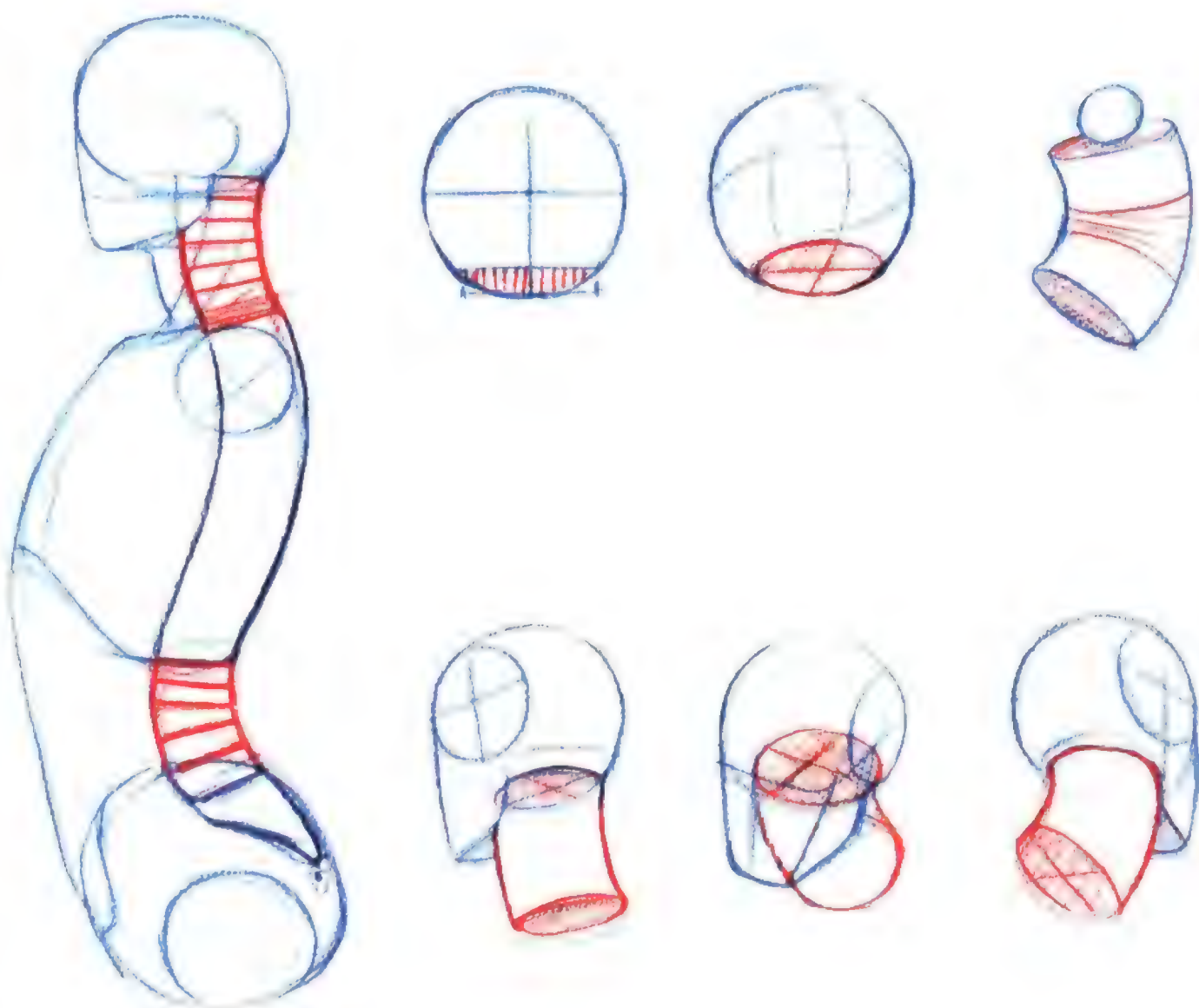
When connecting the square body and the cylindrical body used to shape the torso, as long as there is no error in the connection, the shaped torso can be more

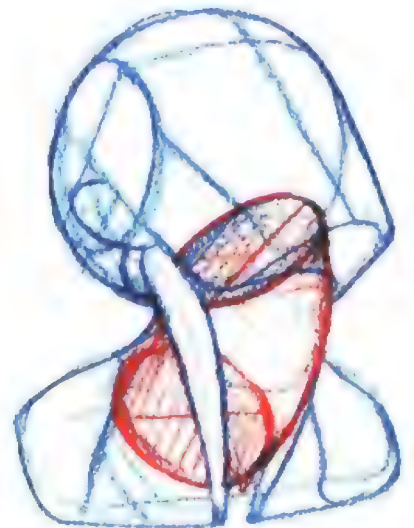
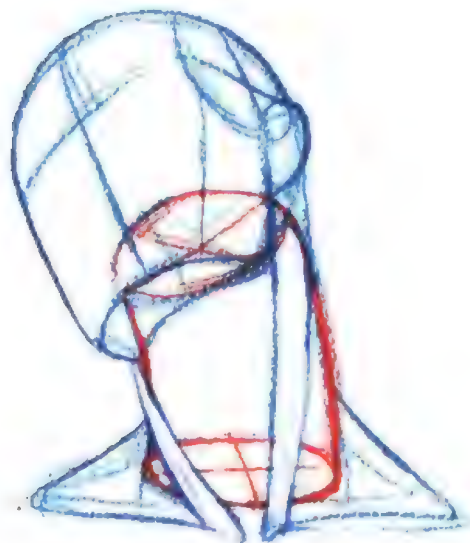
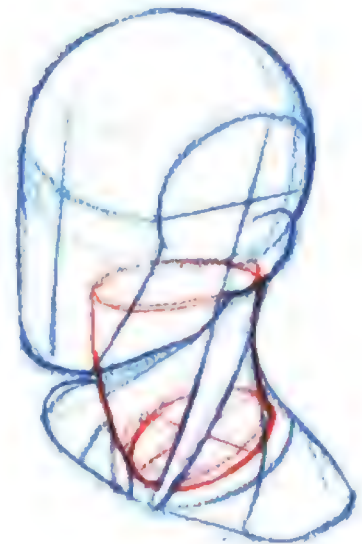
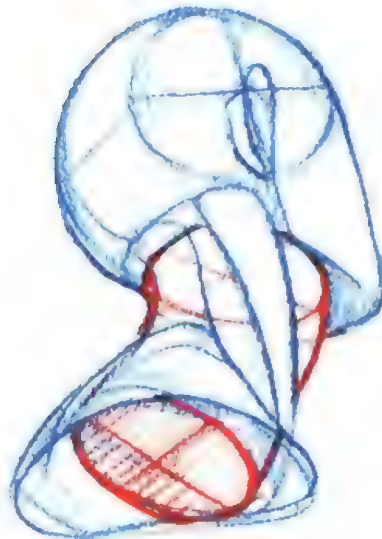
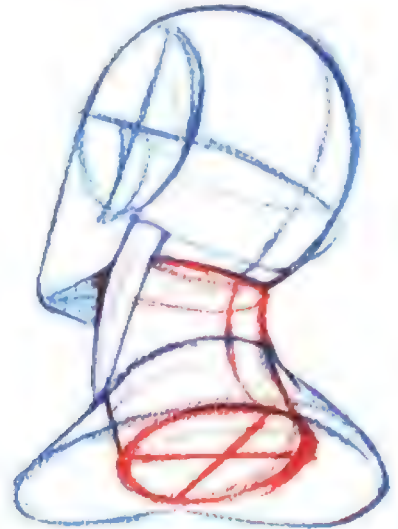
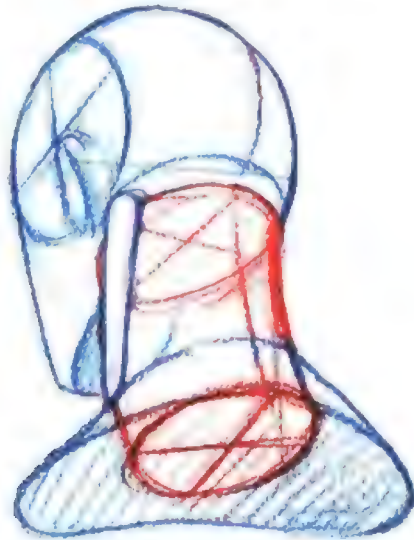


02

Structure of the neck

Before understanding the structure of the neck, we can simplify the head, think of the head as a sphere, and find the connection between the neck and the sphere. Contact. The neck is like a hose, driving the head to move. The geometry we use in our performance is a cylinder, when drawing To feel its three-dimensional relationship, find the cross-sections of the cylinders from different angles and express them accurately.





Control when the cylinder is twisting

The state of the cross-section, and then in the positive

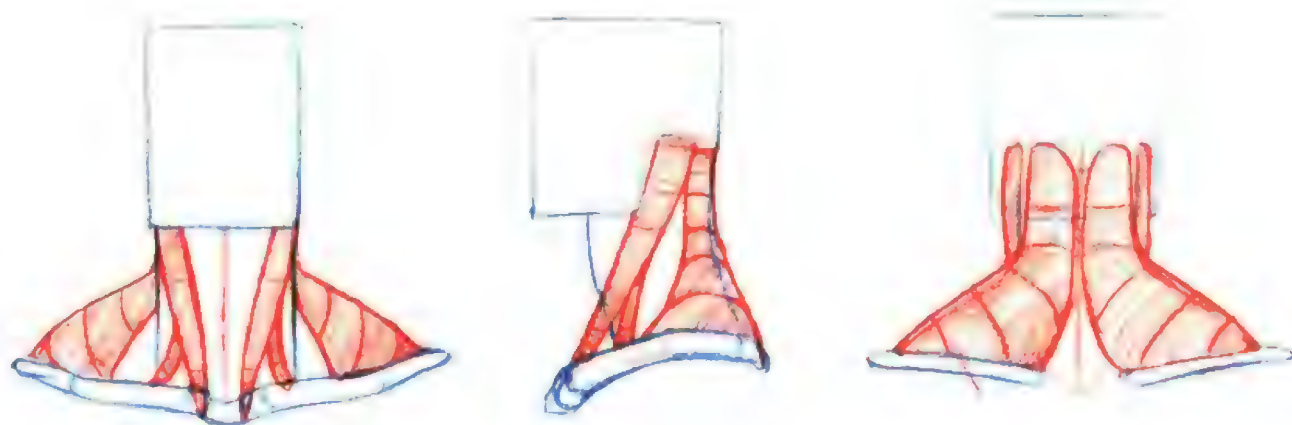
Supplement the cylinder on the basis of correct perspective

The muscles around the body can be clearly defined

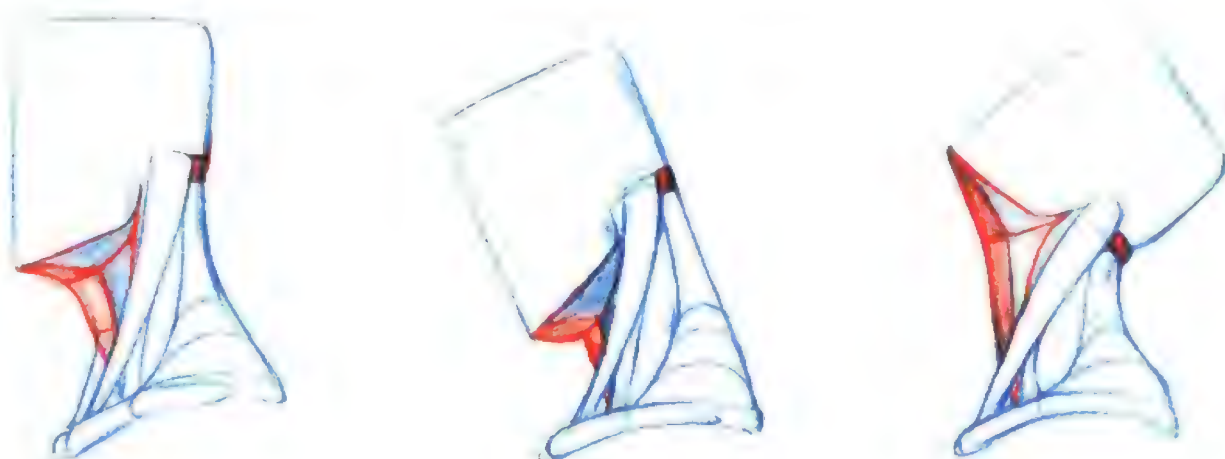
The cylinder is drawn around the neck

The muscle structure of the neck is more complex, and we can easily summarize it into two parts: the sternocleidomastoid muscle and the trapezius muscle. The sternocleidomastoid muscle is the muscle that connects the side of the neck to the clavicle. It is a relatively short muscle group. From the back, it belongs to the extensor group of the square muscle and extends to the clavicle. The trapezius muscle is the second part, it is the largest muscle group in the neck.

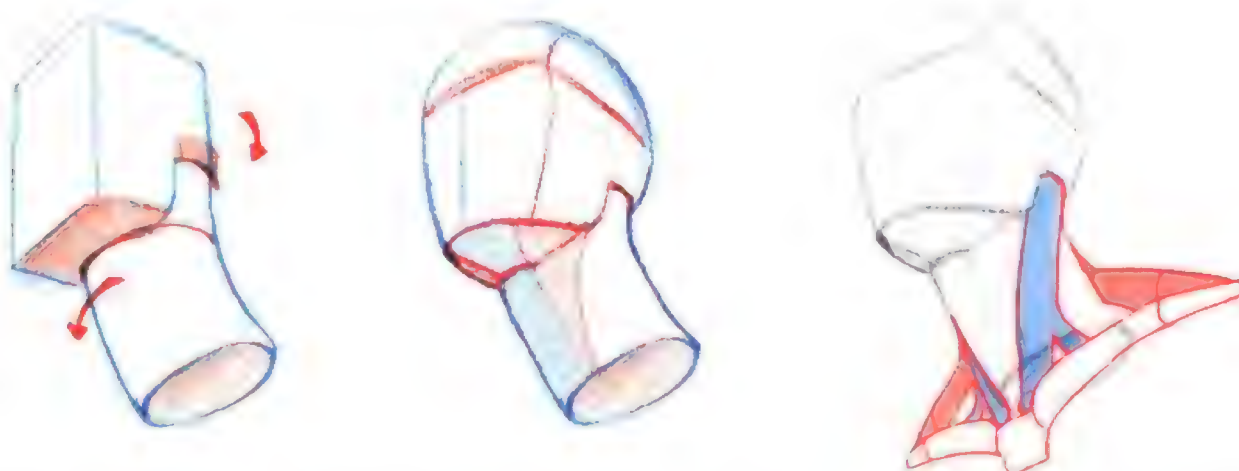
Muscle groups.

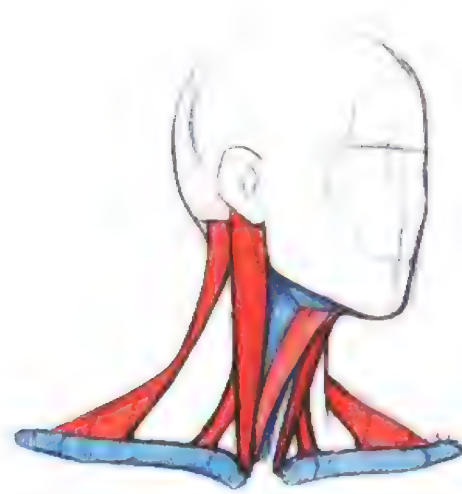


The chin is tightly supported by the neck, showing a certain three-dimensional sense. To draw a good neck, we need to understand the structure of the chin and divide it effectively.

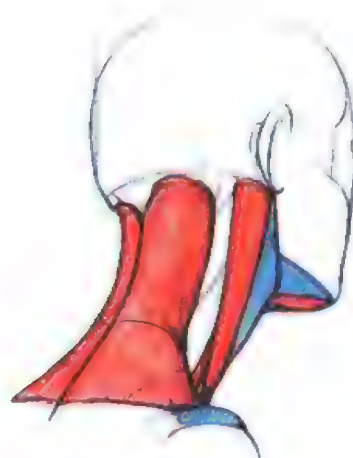


As shown in the figure below, from the angle of taking a line, you can see that the chin area and the neck area have a morphological transition. When we make our necks, we can turn our chin first. Find the relationship well, and then add the sternocleidomastoid muscle and trapezius muscle, so that the drawn neck will be more realistic.

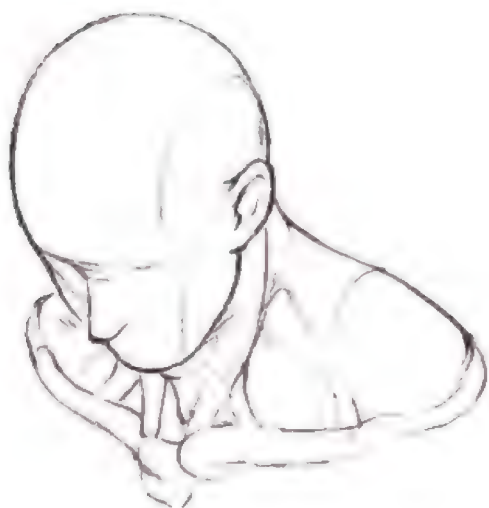




Understand the muscle distribution of the neck
 After that, we can better understand
 The relationship between the volume of the neck and the shoulders
 when drawing a female figure from the neck up.
 We can use the same principle to understand the neck.
 The neck is a very important part of the body.
 It is the bridge between the head and the shoulders.
 It is the key to understanding the neck.



In order to better shape the neck, we can try to practice drawing the connection between the head and the neck at different angles.



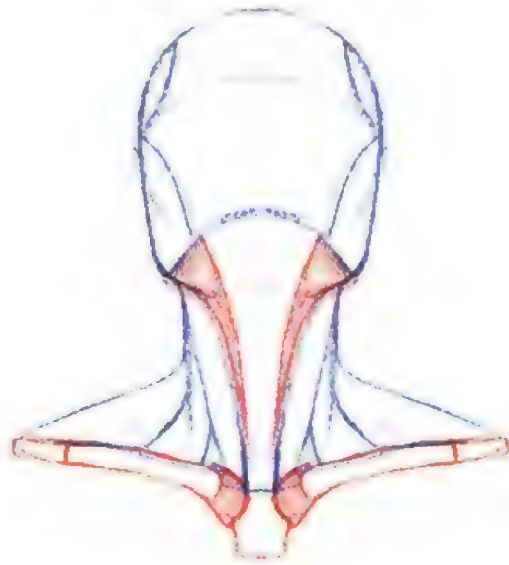
The neck is one of the key parts that express the character of the character, and the thickness of the neck can reflect the strength of the character. You want to shape a very powerful man, then you can use the muscles of his neck. The meat is properly captured, so that it can highlight the power of the characters.



If we want to create a more natural neck, we don't

being able to only pay attention to whether the structure of the neck is accurate is the most important thing

It is important to deal with the relationship between the head, neck, and shoulders



In the head structure, the transparency of the middle part of the cube body

Vision is very important, the transparency of squares and cylinders. Depending on the correct relationship, the connection between the head and neck will be obvious.

It has to be natural.



In reality, the human head is not a square body, a square

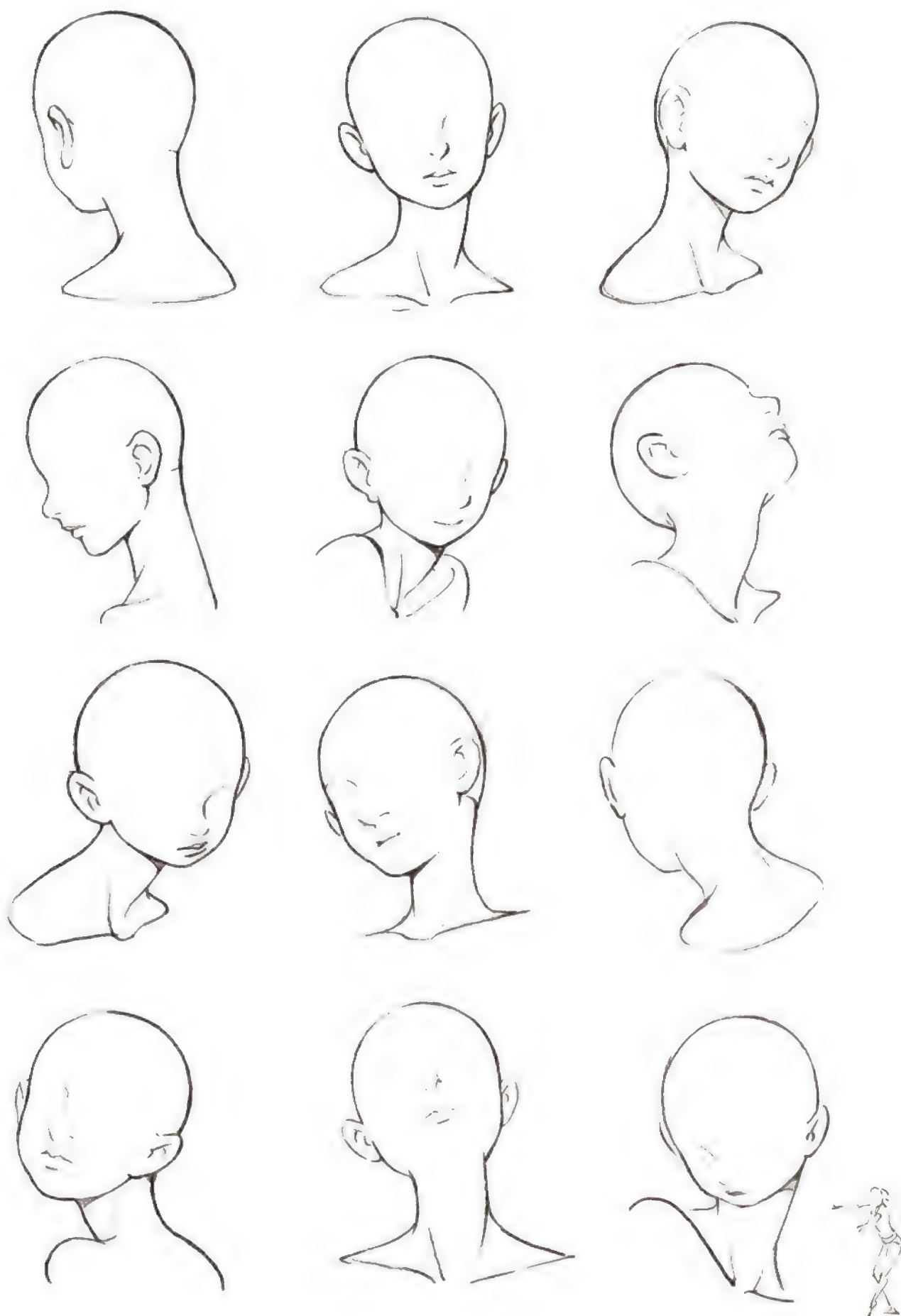
The width of the block is roughly the same as the height of the ears and nose

To deal with the relationship between ears, nose and neck,

You can draw a perspective of the head from different angles

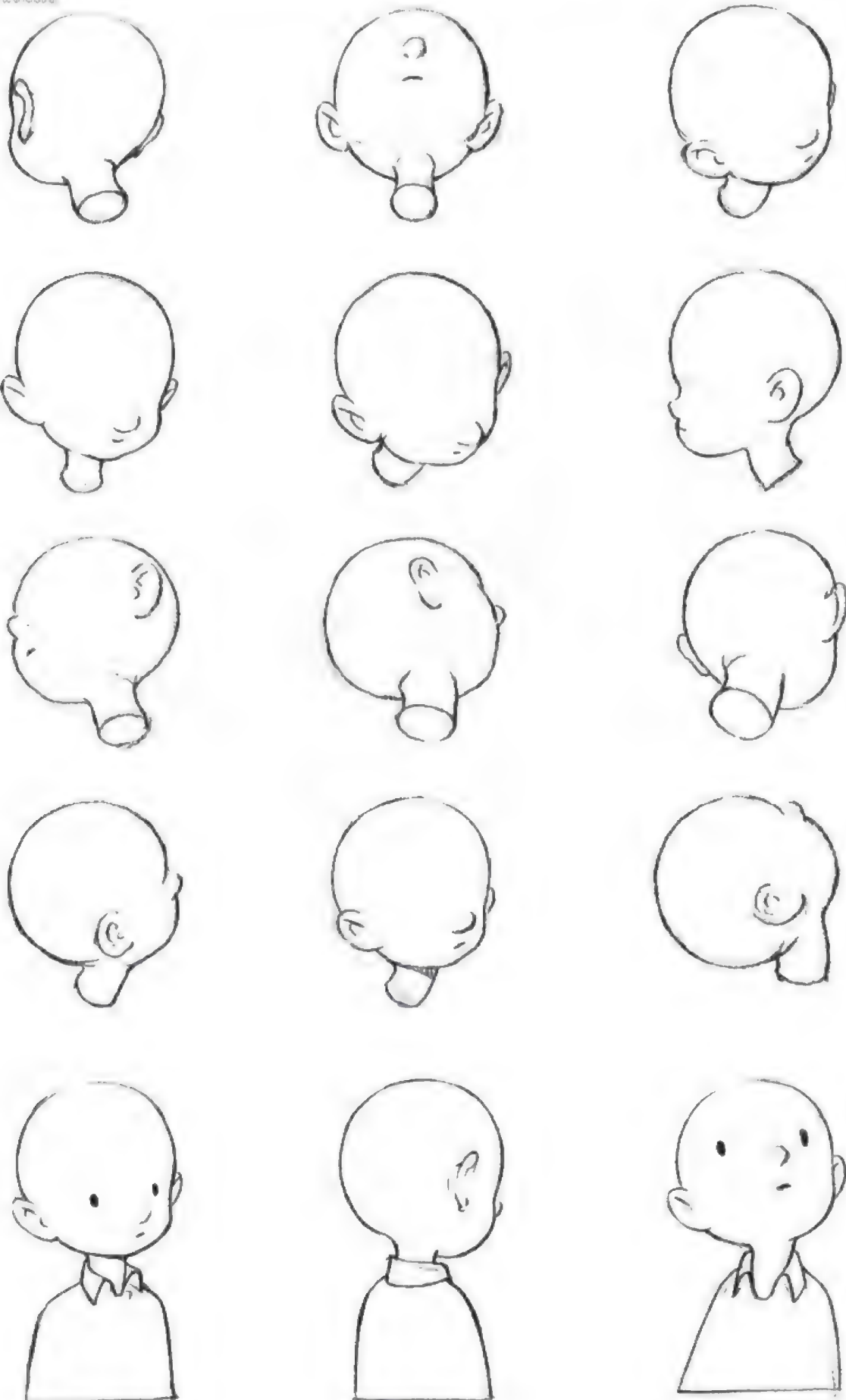


The necks of anime characters are not as complicated as the necks of real characters. When shaping, we use our knowledge of perspective to appropriately simplify the lines and deal with the interspersed relationships of the lines. The sculpted neck will appear real and natural.



It is also very important to express the three-dimensional sense of the necks of anime characters. It is necessary to make the neck define reasonably the direction of the angles, so that the neck can be more alive. It consists of only two contours.

The line composition is also very three-dimensional.

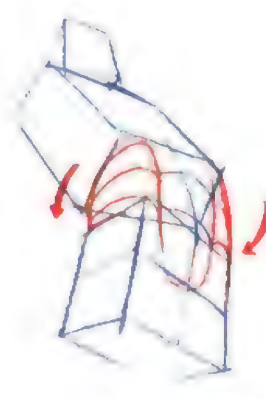
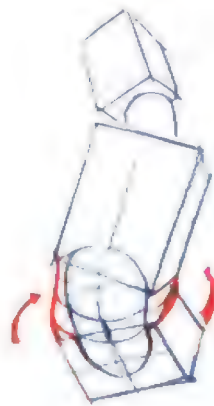
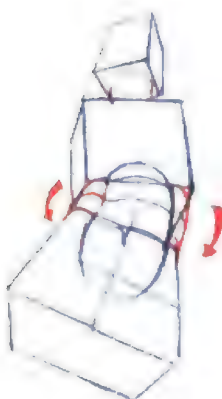
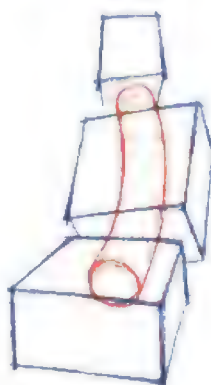


03

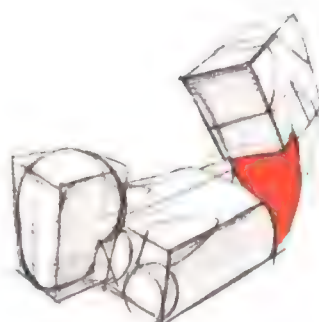
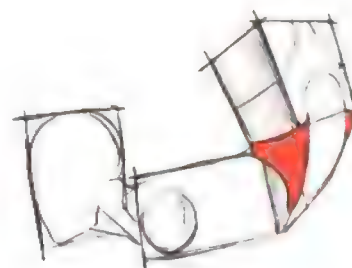
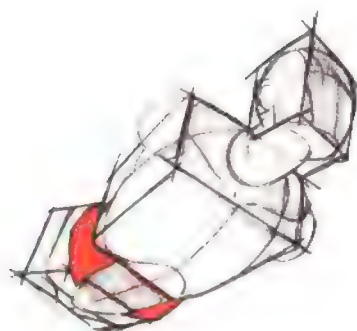
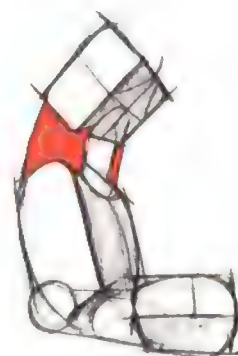
Structure of the waist |

The waist is like a tube wrapped in fat around it,
 And the fat is soft and will occur with the movement of the waist
 Deformation

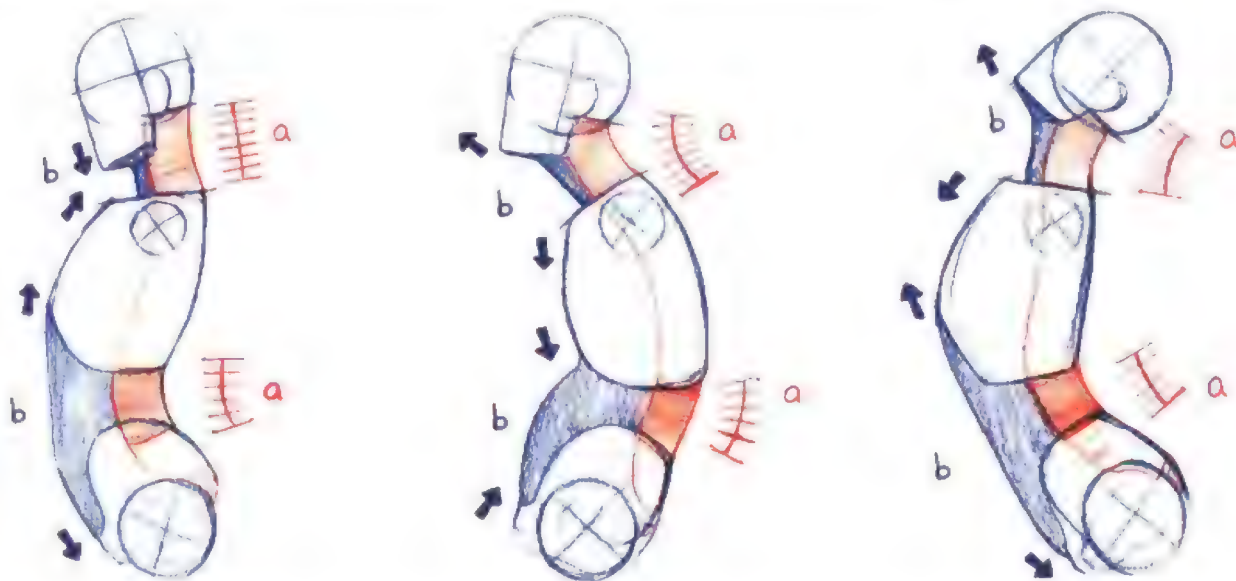
When we practice shaping the waist, the perception tube
 The perspective of the child and the shape of the tube when it twists are very
 important. Don't rush to show the state of the muscles, more
 More should be done in three-dimensional perception exercises



We can use two squares to practice shaping a waist with reasonable twisting, and learn to control the length and shortness of the waist and the shape changes after twisting.

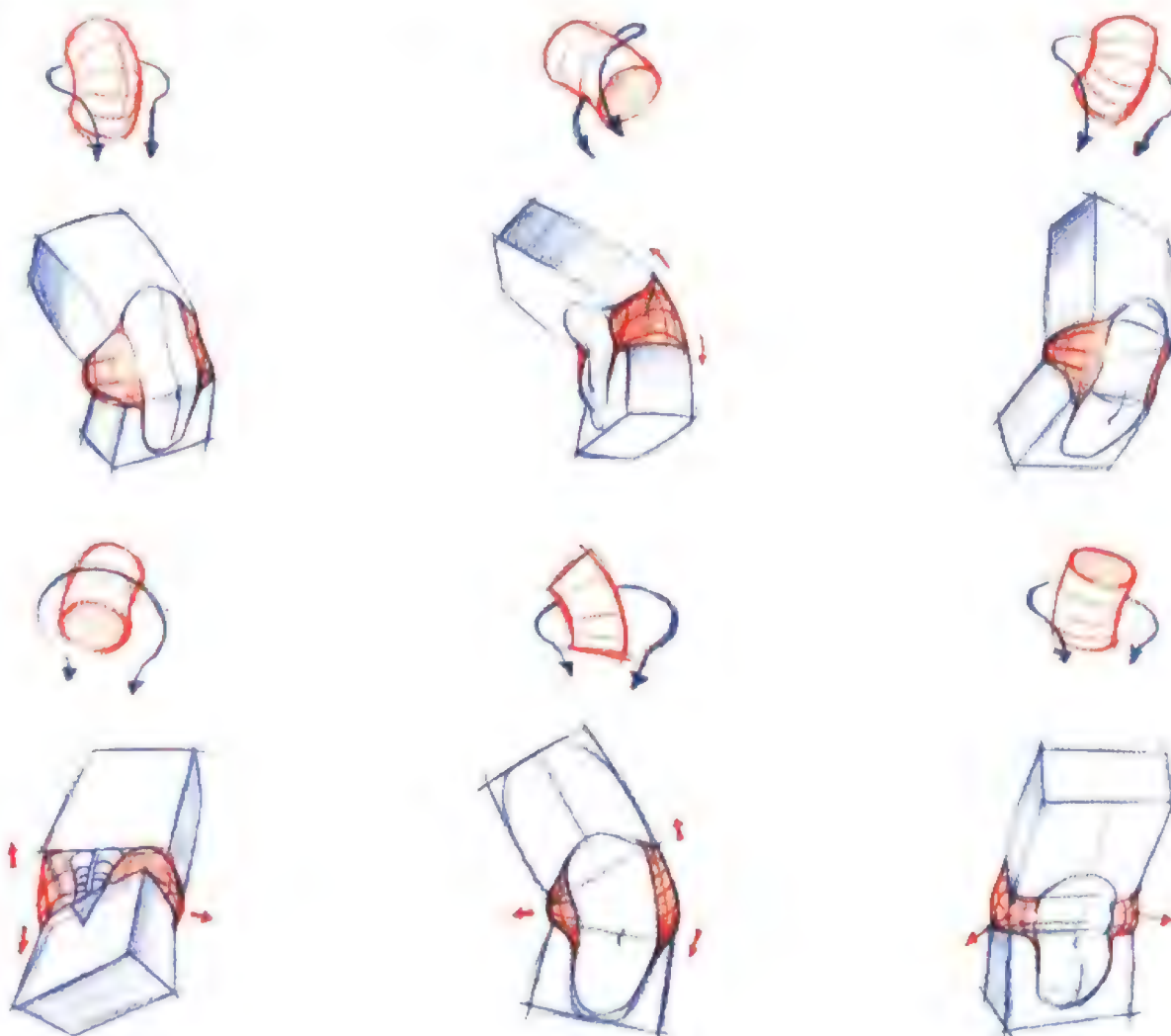


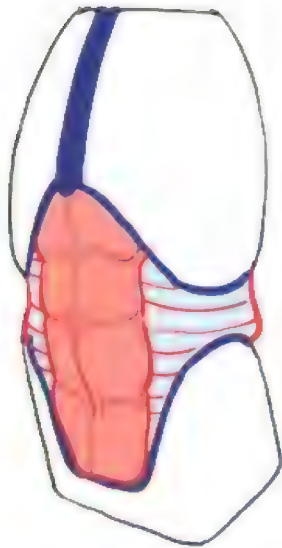
The length of the human spine does not change when twisting, and at most the scaling in perspective occurs. The first half of the neck and waist are composed of muscles. When twisting, these muscles will adapt. When stretched, the length of the front side of the spine can be squeezed and deformed with twisting, while the back side will not pull the neck and waist due to twisting.



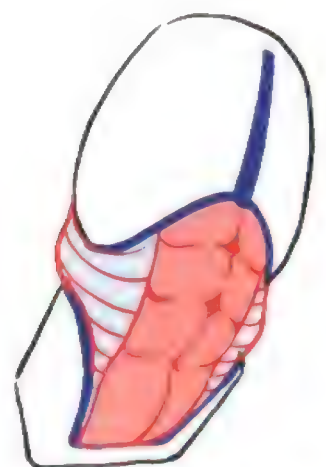
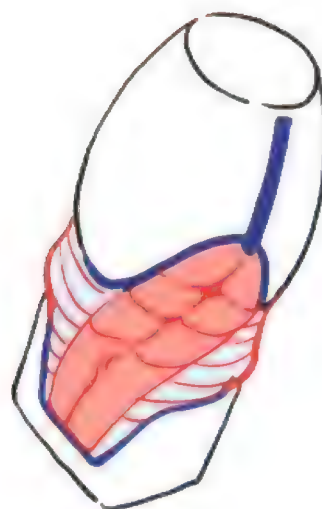
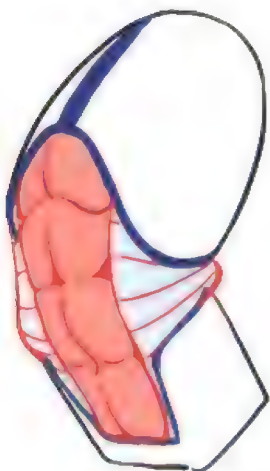
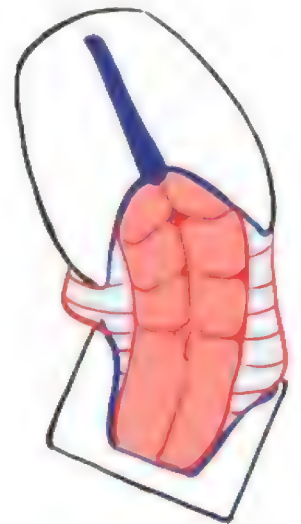
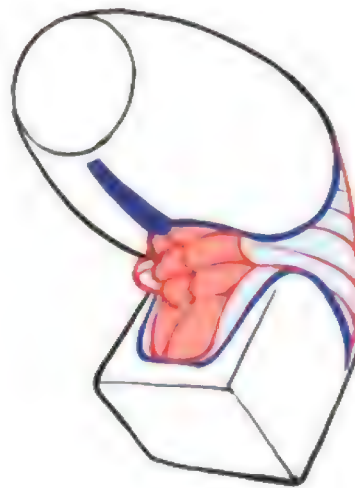
When we shape the waist, under the premise that the posture of the body is correct, we can use all kinds of ways around the waist to represent the posture of twisting the waist, and do not have to worry about the waist.

It will be easier to twist the waist.





Usually when showing strong characters, we all like to emphasize the eight-pack abs and draw them very hard, but this it's not convenient to recognize the twisting waist. We can try to think of the abdominal muscles as pieces of soft rubber, when they twist or it will deform when squeezed. By mastering the law of deformation, the waist can be shaped more realistically and rationally.



The next is a somewhat less effective way of representing the relationship between the torso and the legs, which is shown by the third man and the fourth woman. The third man is shown in a somewhat less effective way of representing the relationship between the torso and the legs, which is shown by the third man and the fourth woman.



The most difficult corner is upper front of women and trousers (overlapping) that the 2 women at the ground appearance of front waist will appear stout and short.

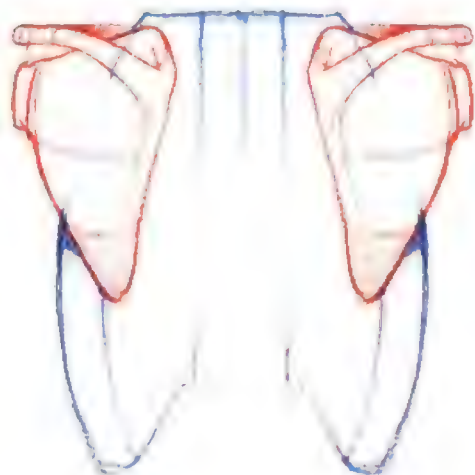
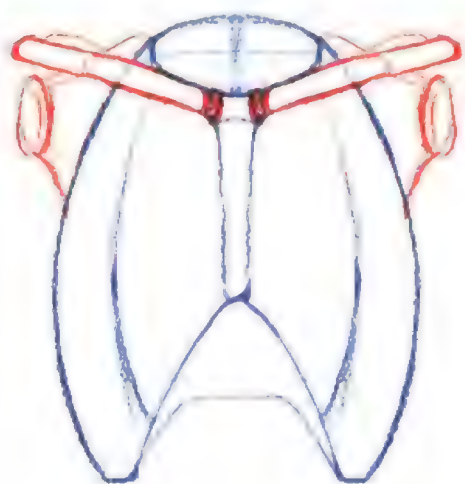


04

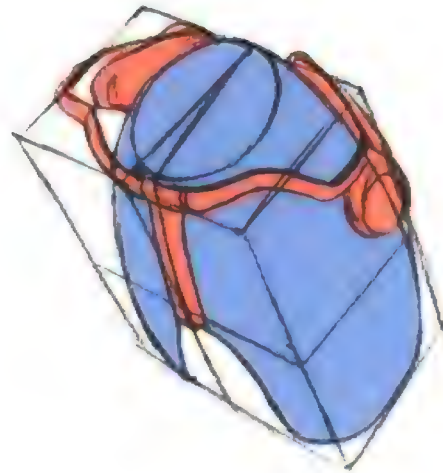
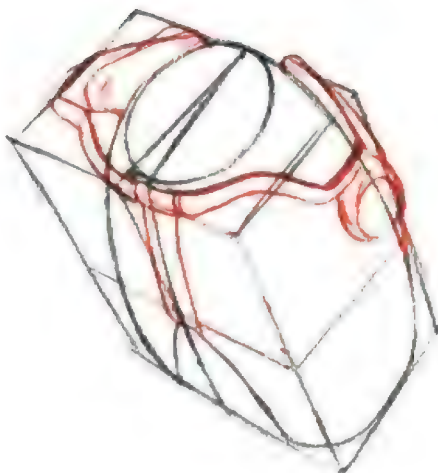
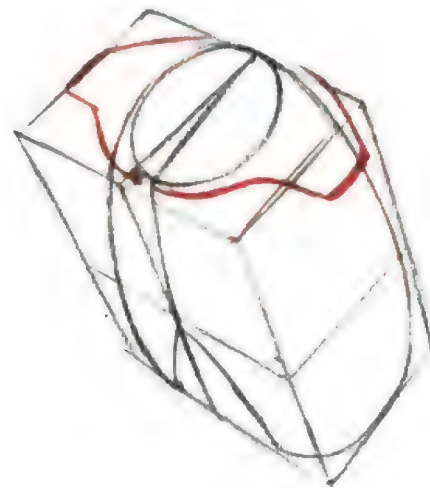
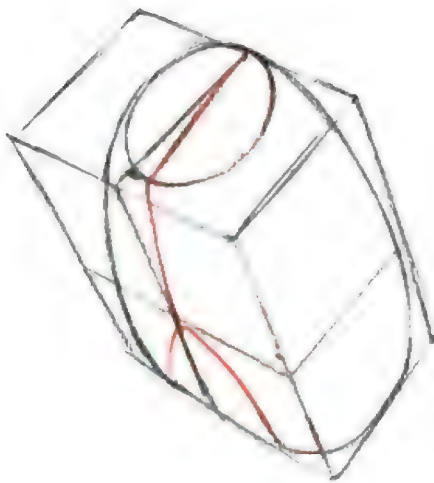
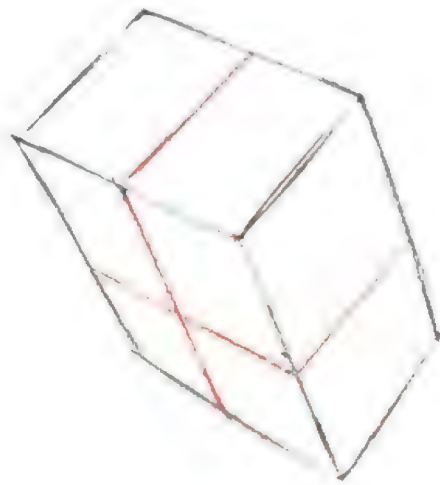
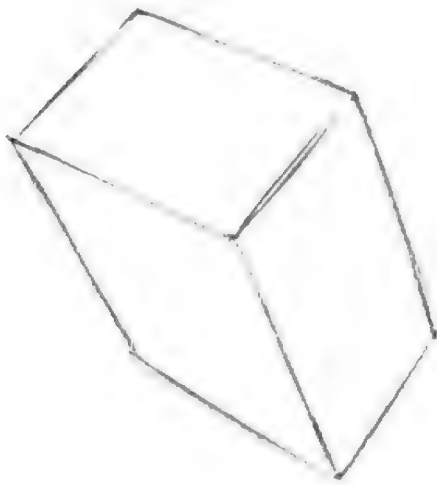
Structure of the chest cavity

The bone integrity of the human chest cavity can be divided into relatively stationary areas and relatively moving areas, and the entire chest cavity can be regarded as a simple one.

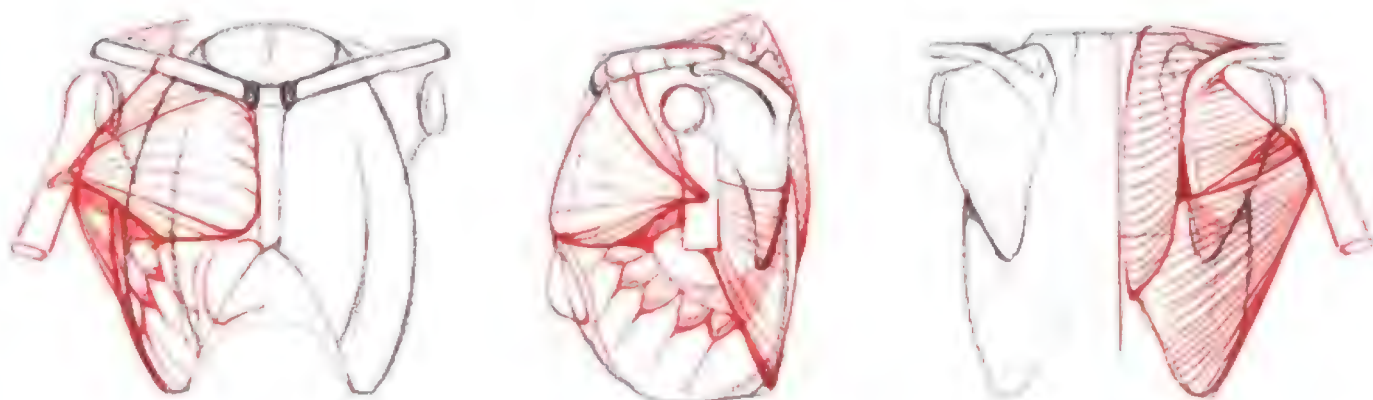
A structure formed by a combination of a shape and two clips.



We add an extra line to help you see the perspective of the object, so that it is easy to add muscles to the figure.



There are many small muscles interspersed around the chest cavity, and it is very time-consuming and laborious to check these muscles one by one on the anatomical chart.



Some muscles are relatively stationary, and some are relatively moving. The muscles are divided into two groups: relatively stationary muscles and relatively moving muscles. The muscles are divided into two groups: relatively stationary muscles and relatively moving muscles.

Dynamic state



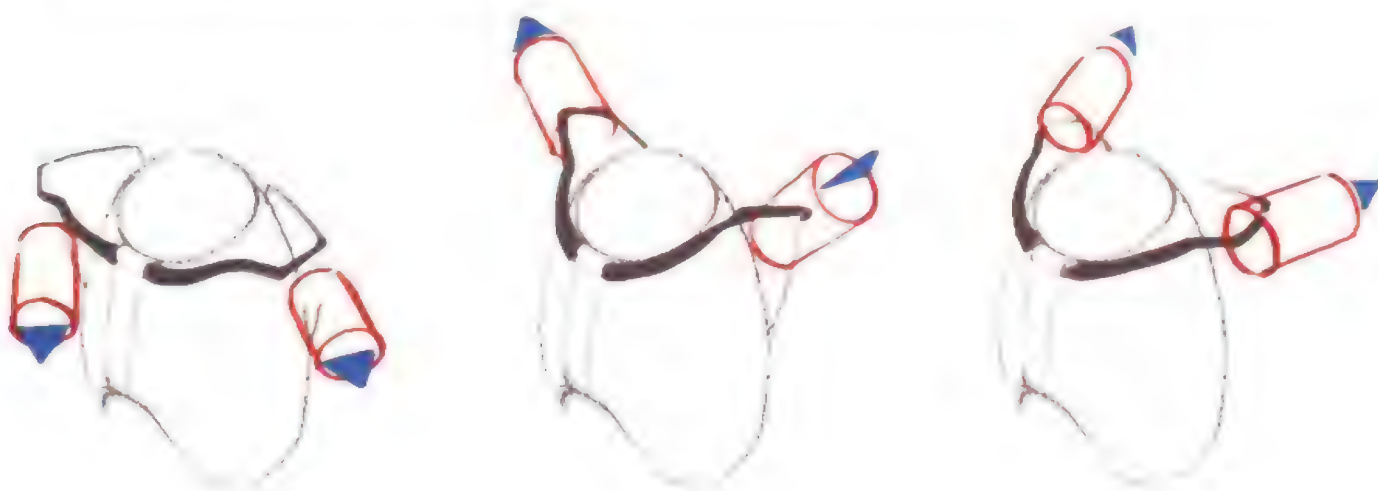
The muscles can be divided into relatively moving muscles and relatively stationary muscles according to the state of movement. The muscles in relative movement mainly include the pectoral muscles, trapezius muscles, and latissimus dorsi. The muscles in relative movement mainly include the pectoral muscles, trapezius muscles, and latissimus dorsi.



It mainly affects the clavicle and the opening bone. We can think of the clavicle and the opening bone as clips, and first show the perspective of the movement of the clips clearly.



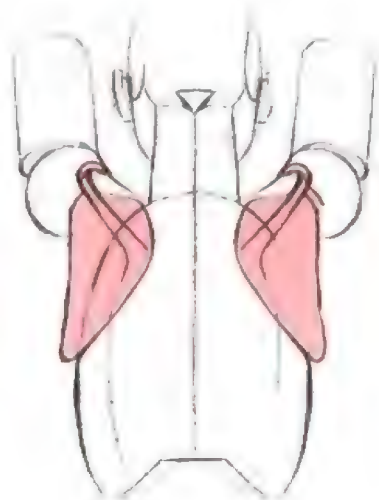
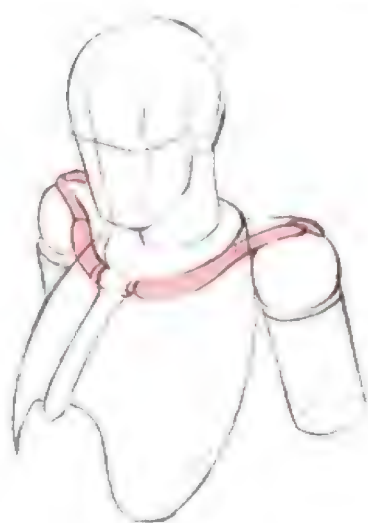
To expressing perspective-side of the arm, the cylinder representing the arm can be adjusted in perspective with the base of the movement of the leg, so that the movement side of the arm can be more vivid.



After showing the movement side of the arm, then considering the tension and squeezing relationship of the muscles, you can draw the arm and leg more vividly.



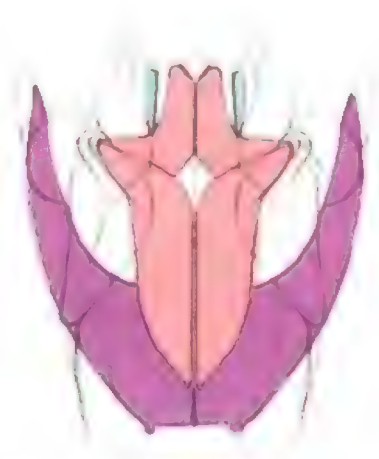
Next, the drawing steps of the snail stem are shown. First, make it clear the basic brackets of the character's head, neck, chest cavity and arms.

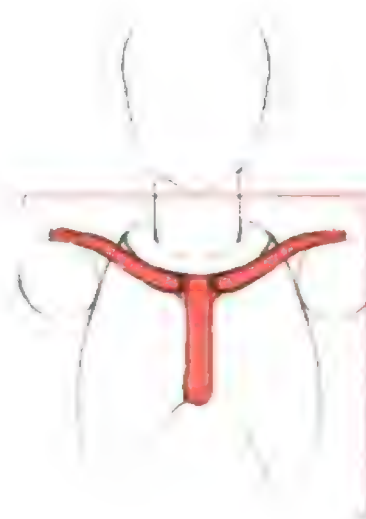
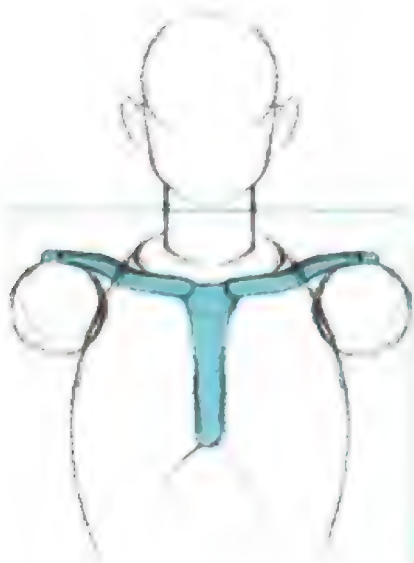


Continuing, gradually make the snail's body structure more detailed, showing the snail's body structure and the shell.



Continue to make the snail's body structure more detailed, showing the snail's body structure and the shell.

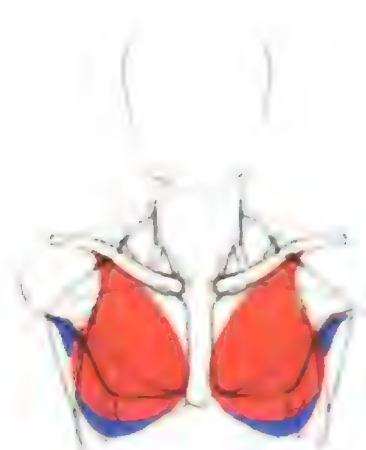
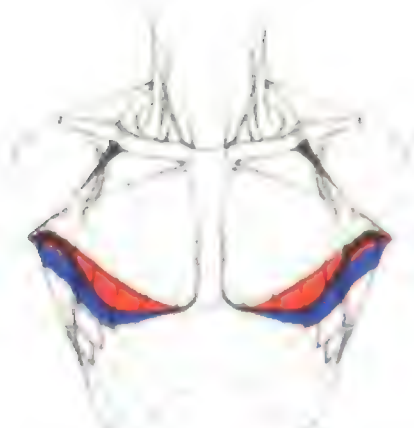




Men's chest cavity is wider and longer than women's.
We have to do this consciously when drawing the chest cavity.
Kind of proportional adjustment, the upper half of the male drawn in this way.
The body will be stronger than that of women.



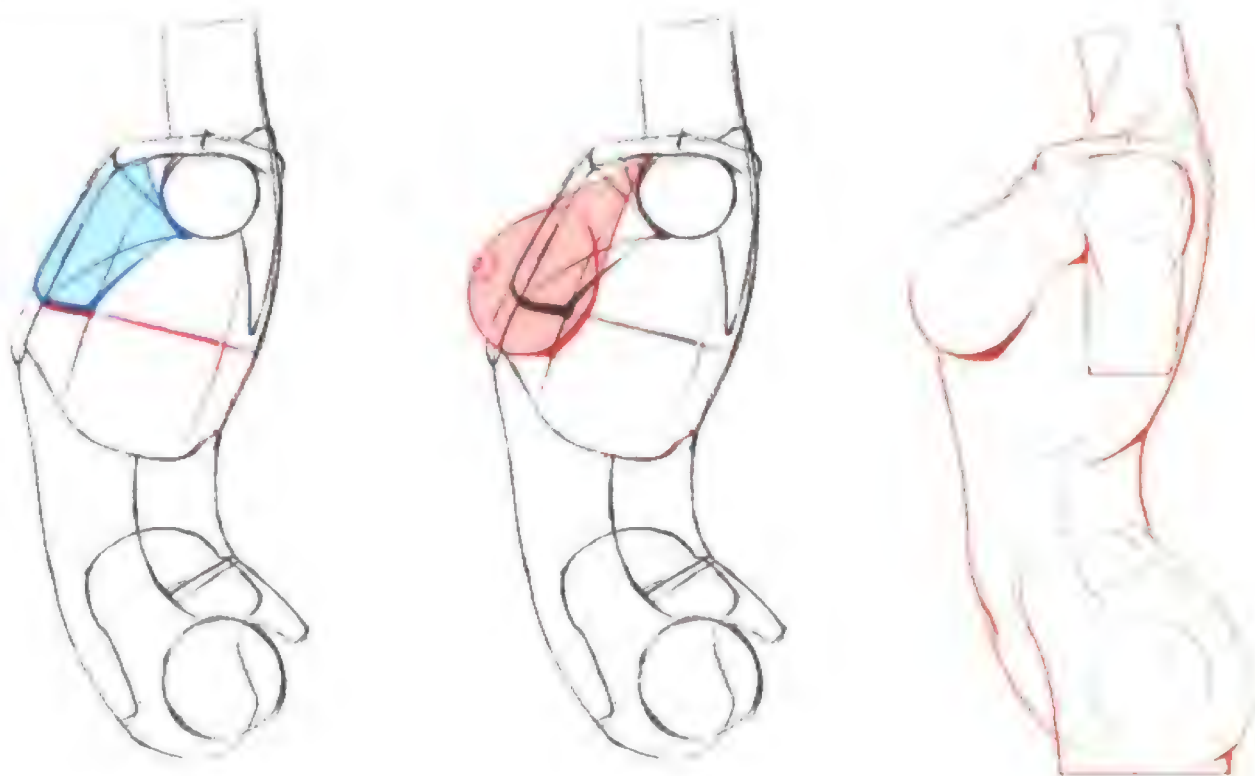
The pectoral muscle area of men is larger than that of women, which is
The difference is due to the different sizes of bone cores.



There is less fat distribution on the chest of men, this is one of
the key points to distinguish between men and women.



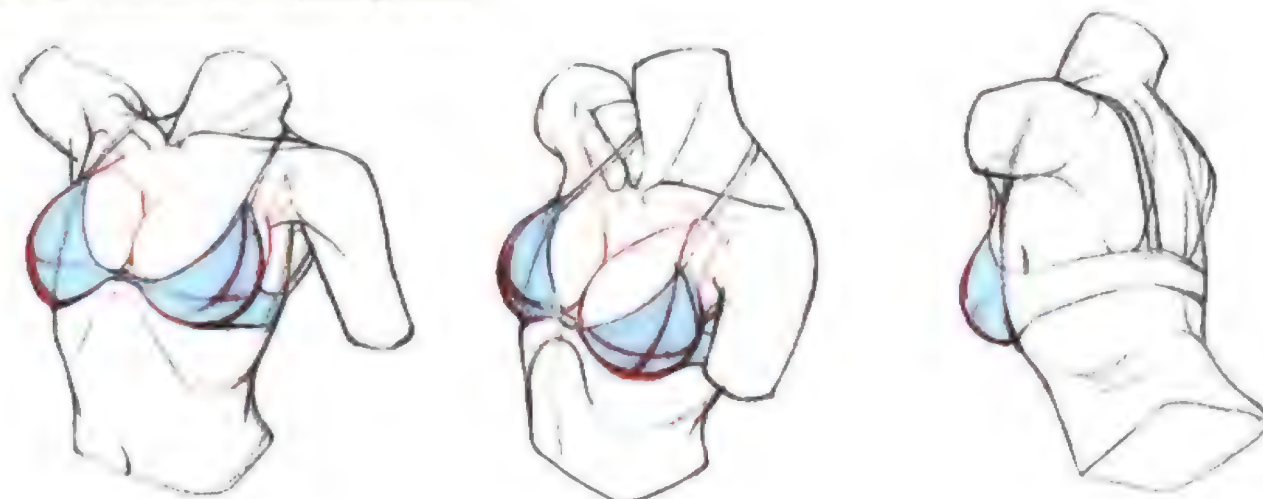
When drawing a woman's chest, first identify the muscle part. On this basis, imagine hanging a balloon with water on the chest cavity and then drawing the contour line according to the force state of the balloon. you can Draw a natural female chest.



Women's breasts appear in different states from all angles.



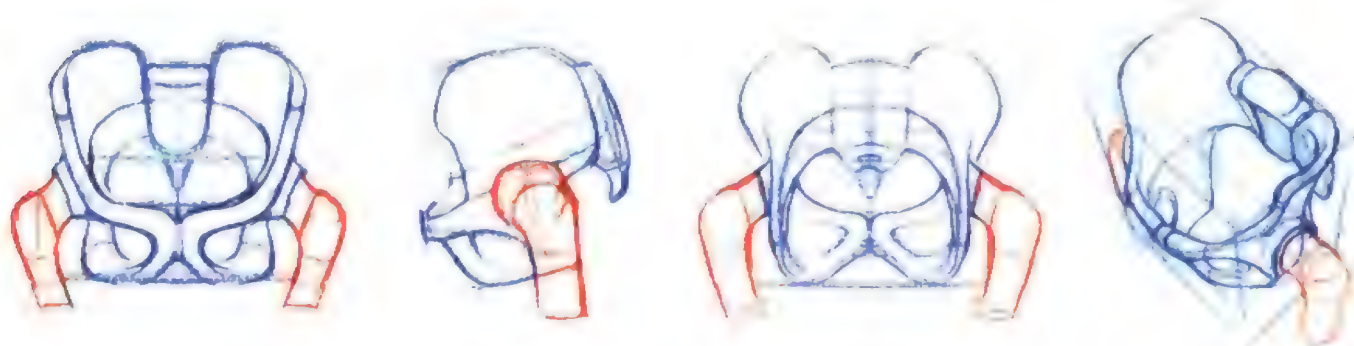
The cleavage of women's breasts is produced by squeezing, not naturally.



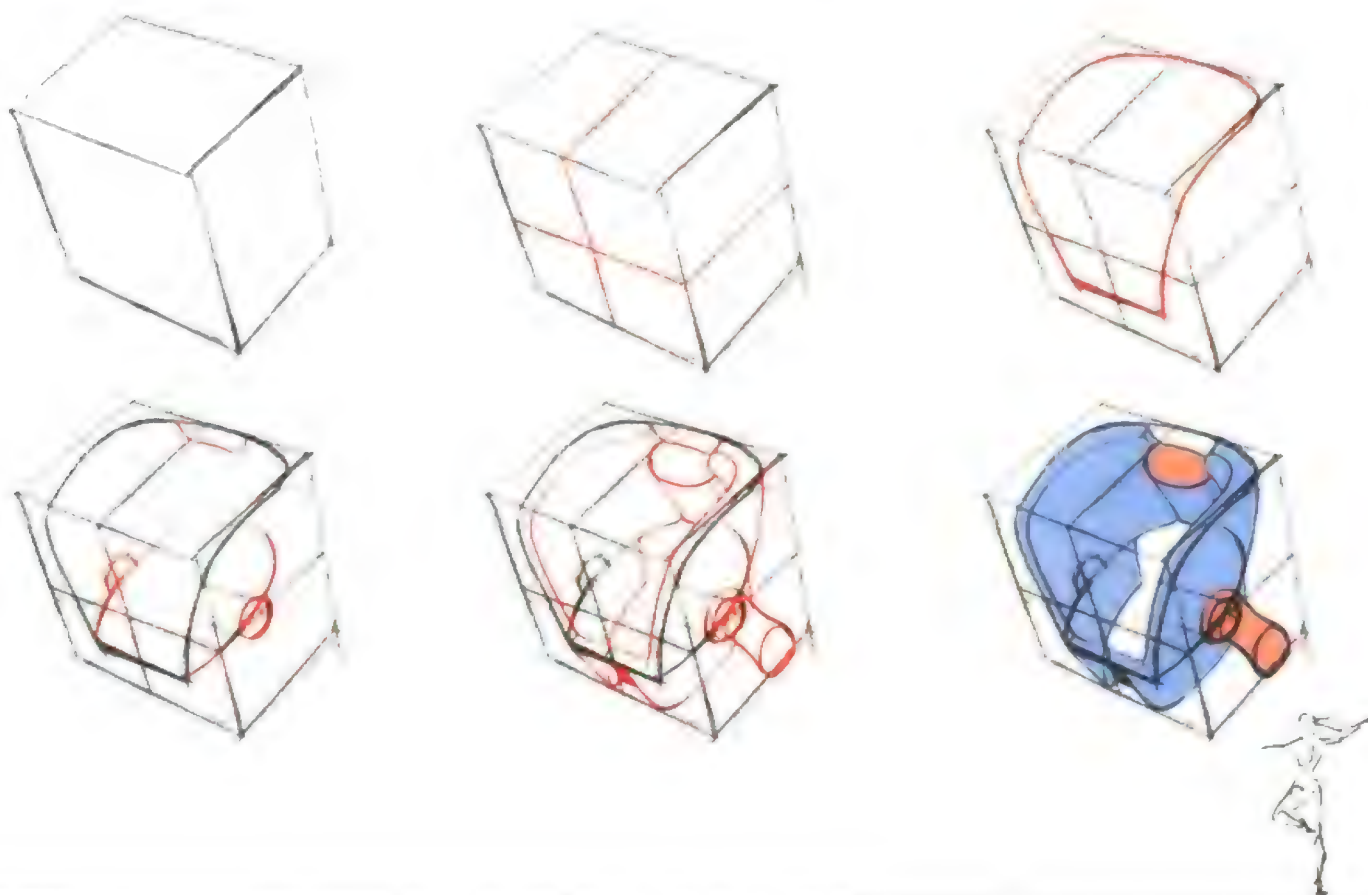
05

Cross-departmental structure

The bone structure of the human pelvis is more complicated, and drawing the pelvis is the key to drawing the lower body well. The pelvis is similar to a classic mountain in a square body. After painting, focus on the pelvis. The relationship between the three-dimensional perspective and the left and right perspective of the large rotor (located above the pelvis) is the key point to correctly draw the movement law of the lower body.



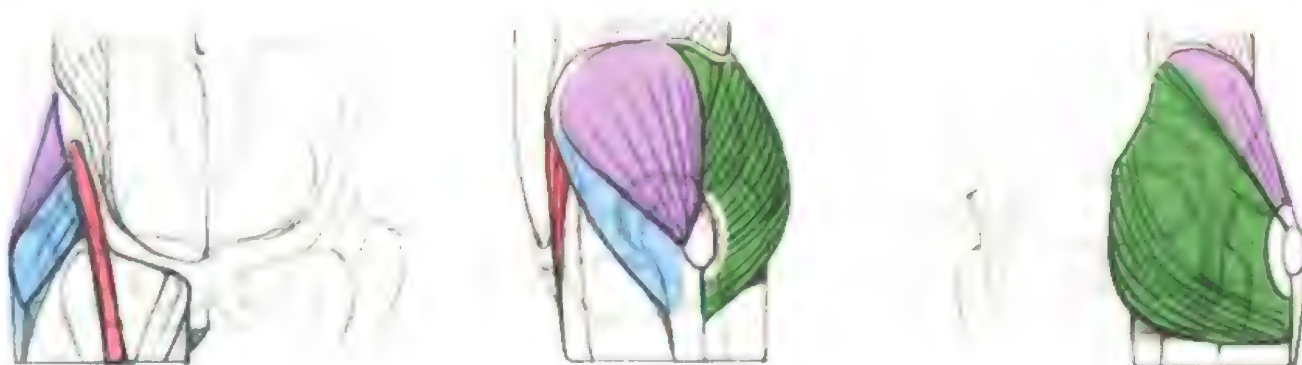
The following picture shows the steps to slowly draw the pelvis in a square body. As can be seen from the figure, the drawing of the pelvis must first find a common perspective law. On the basis of the correct perspective, slowly find the corresponding reference point to make a strong construction, so that the three-dimensional state of the pelvis can be drawn more easily.



The muscles on the penis are intricate, and we can colour partition these muscles, which will be of great help to master the local muscle structure of the penis.



The muscles in the pelvic region are the muscles of the penis, the muscles of the penis, the muscles of the penis, and the muscles of the penis. These muscles are the muscles of the penis, and it will no longer be described.

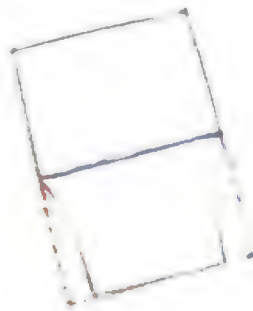
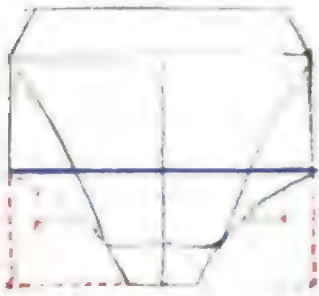


When we draw these muscles, we should pay attention to the fact that the penis is a muscle, so that the penis is a muscle, and it will no longer be described.

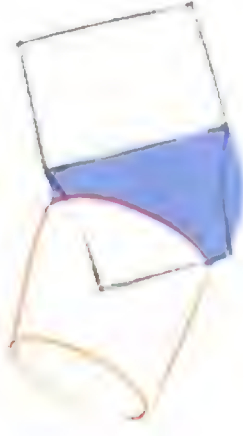
Body beauty



After understanding the muscle groups of the pelvis, we must also focus on the use of geometry on the pelvis. Think of the pelvis as a cube and cut it below one-half of the cube. Cut out two arched areas.



Fill the cube with blue paper and then represent the female perspective. Add a high. Through the center of the cube, draw the perspective drawing. If the drawing is not a cube.



After using a pencil perspective technique of drawing, some of the most important and difficult to draw are the curves of the body. In the drawing, some of the most



The difficulty of drawing the cross section is to shape the lone line at the root of the thigh. Improper shaping of the lone line will directly lead to imbalance in the proportion of the legs.



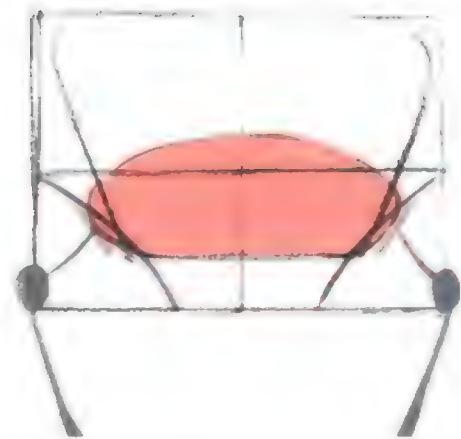
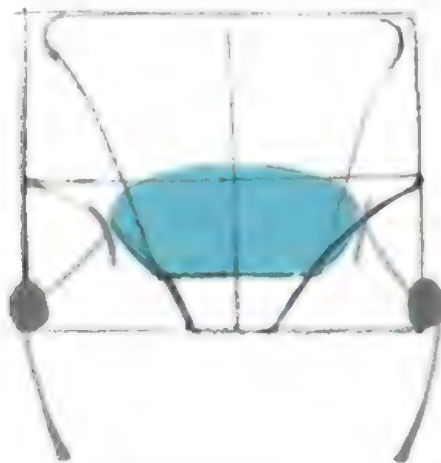
Using the perspective of the drawing, drawing perspective also the connection between the legs and the body, it is necessary to point to the muscles and draw the body in a more accurate manner.



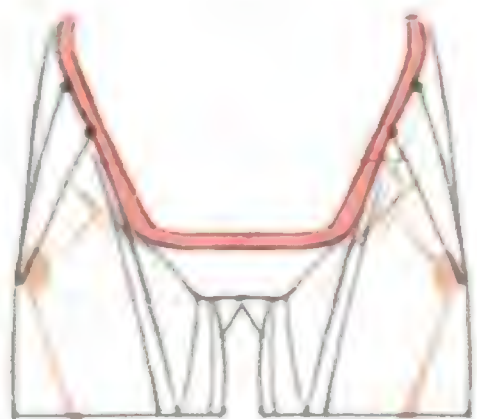
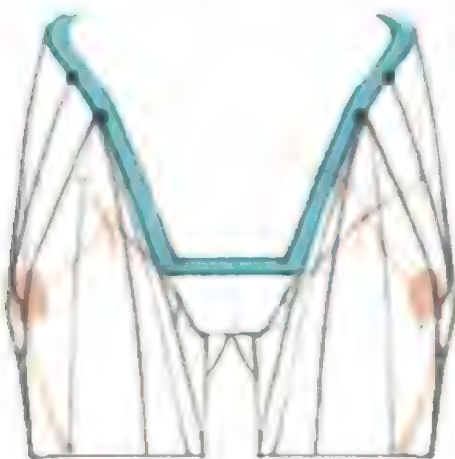
Point-to-point connections are made in the cube. Such exercises can help us express the interspersed and three-dimensional sense of local muscles more accurately.



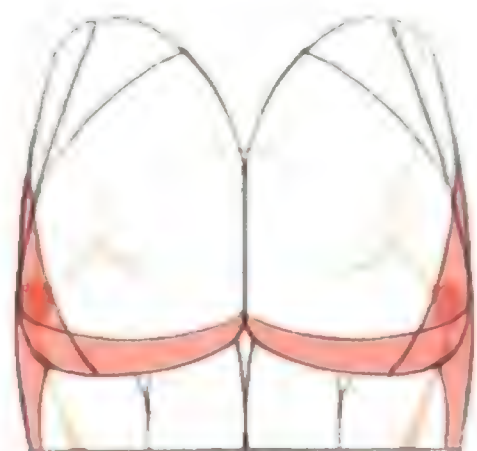
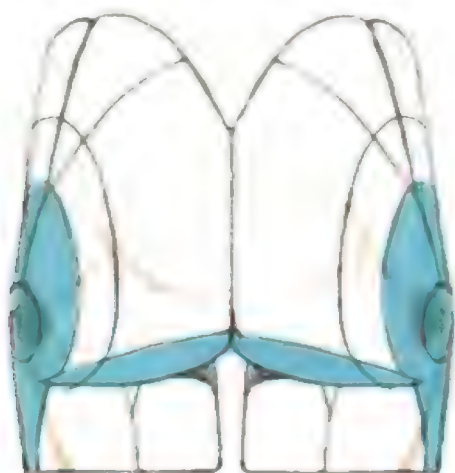
There are several obvious differences between the male pelvis and the female pelvis.



The biggest difference between the male pelvis and the female pelvis lies in the structure of the bottom of the pelvis. This is due to the different physiological structures of men and women: men do not have a uterus and cannot give birth. Therefore, the bottom of the pelvis is relatively small; women have the ability to give birth, but they need a wider passage, so the bottom of the pelvis is relatively wide.



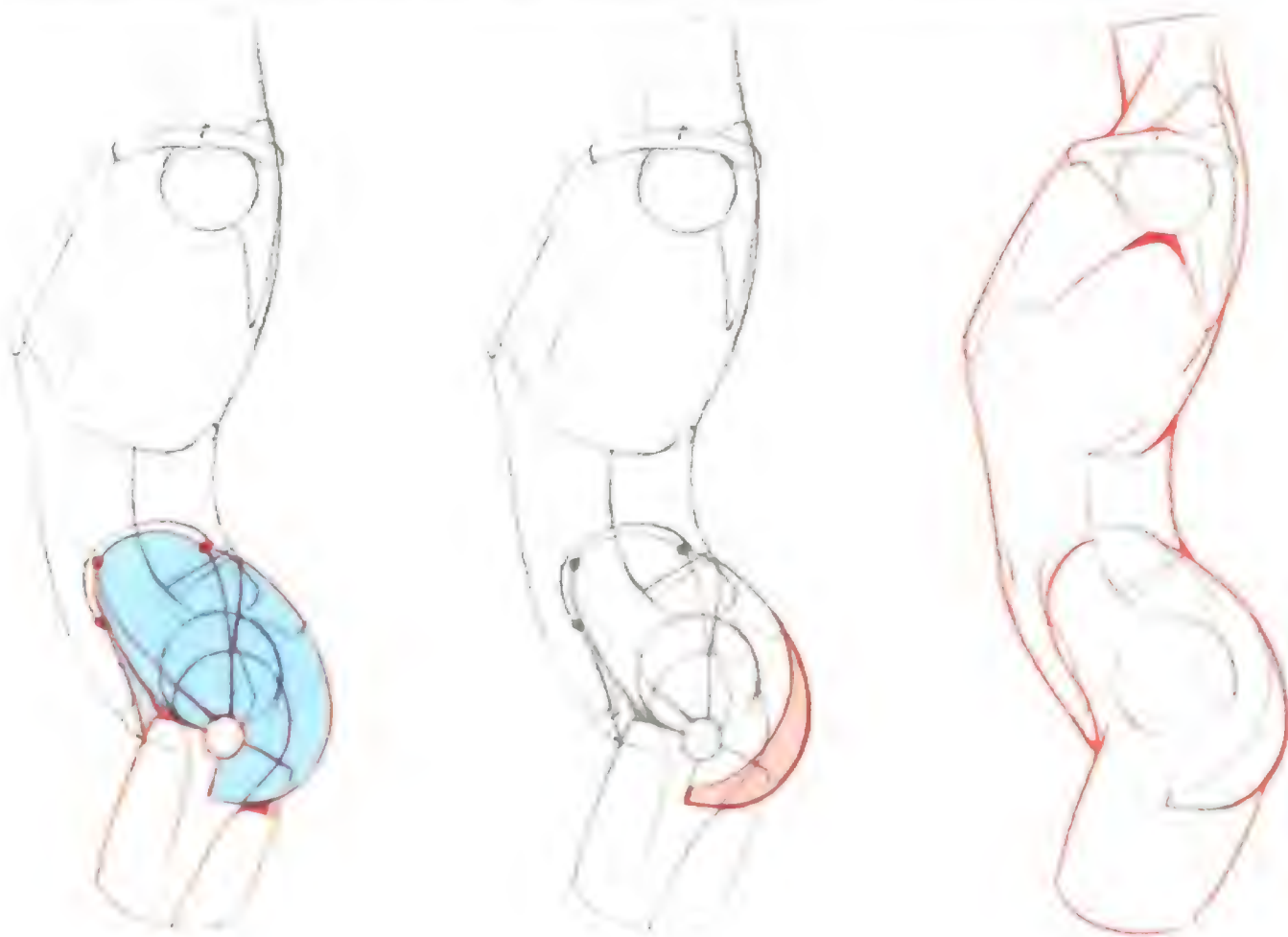
The shape of the pelvic bones of men and women is also different: the male part of the pelvis relates to the area that is not covered by muscles and is only covered by skin, which is a thickness of the "uterus". The male pelvis is relatively long and narrow, while the female pelvis is relatively wide and flat.



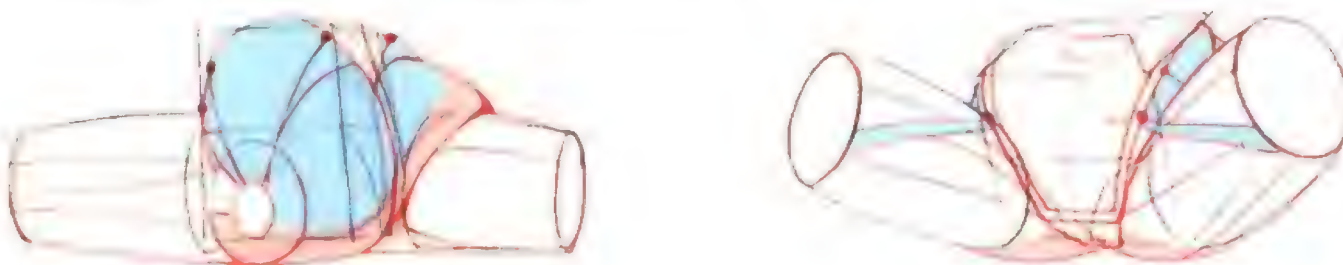
There are also some differences in the shape of the male and female pelvis: the male pelvis is relatively long and narrow, while the female pelvis is relatively wide and flat. The male pelvis is relatively long and narrow, while the female pelvis is relatively wide and flat. The male pelvis is relatively long and narrow, while the female pelvis is relatively wide and flat.



The goal of drawing muscles is to find the top of the muscle and the position of the bone. The main movement points of the represented arm showing the movement lines are also shown. If there are no lines



If the arm is bent, the main movement points of the arm are shown. The main movement points of the arm are shown. The main movement points of the arm are shown.

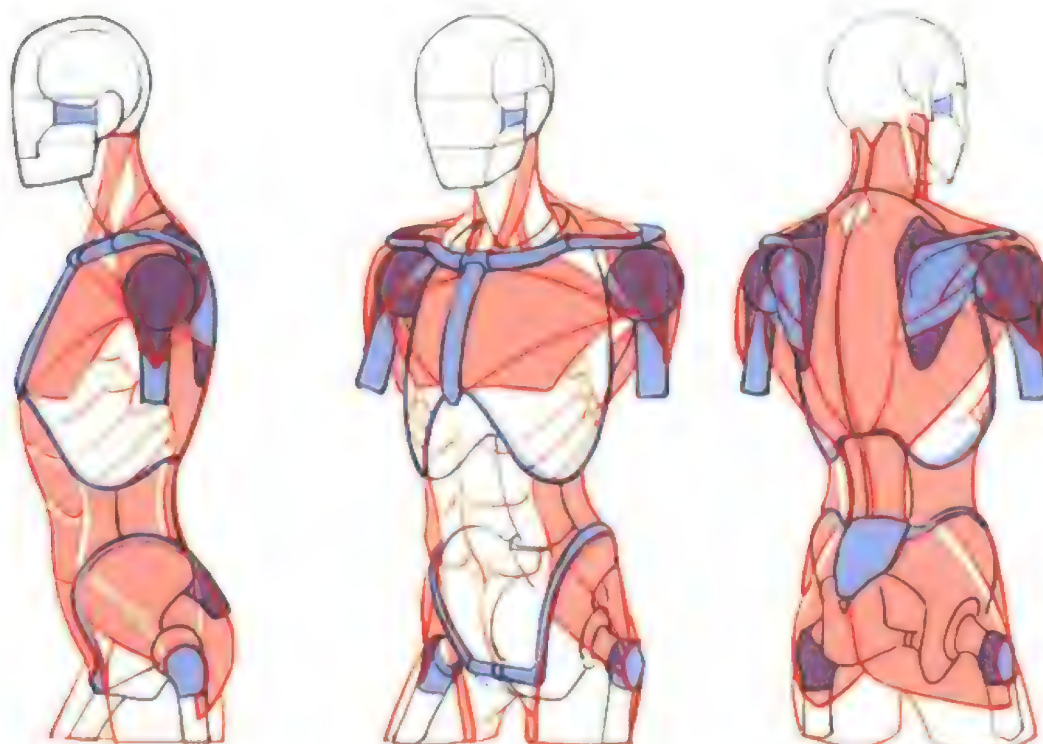


If the arm is bent, the main movement points of the arm are shown. The main movement points of the arm are shown. The main movement points of the arm are shown.



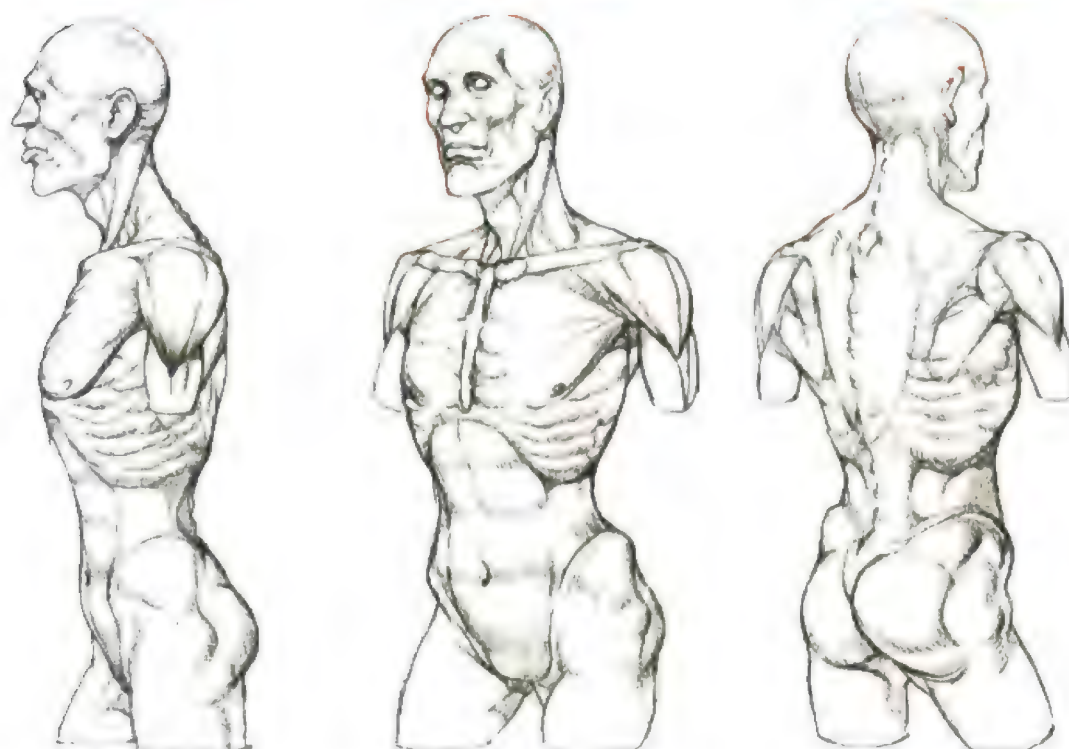
06

Comparison of the torso of a thin person and a thin person

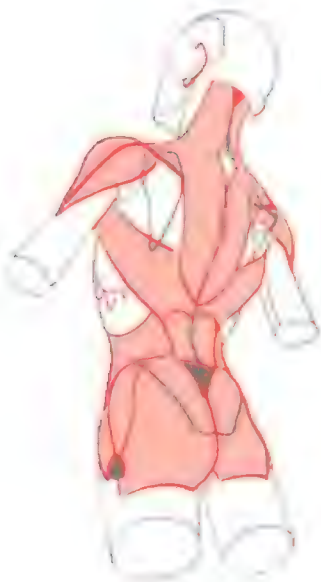
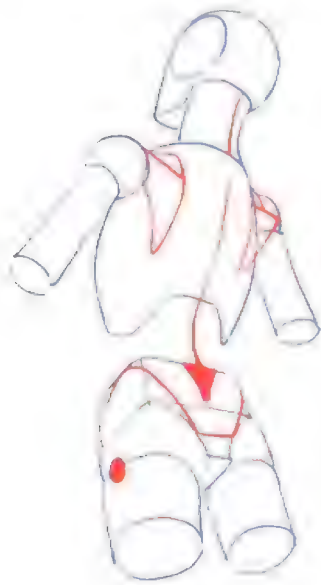


The characters are fat and thin, the same
 When the body shape of the character changes, its
 The size of the bone will not change, it will change
 The transformation is mainly the muscles on the bones

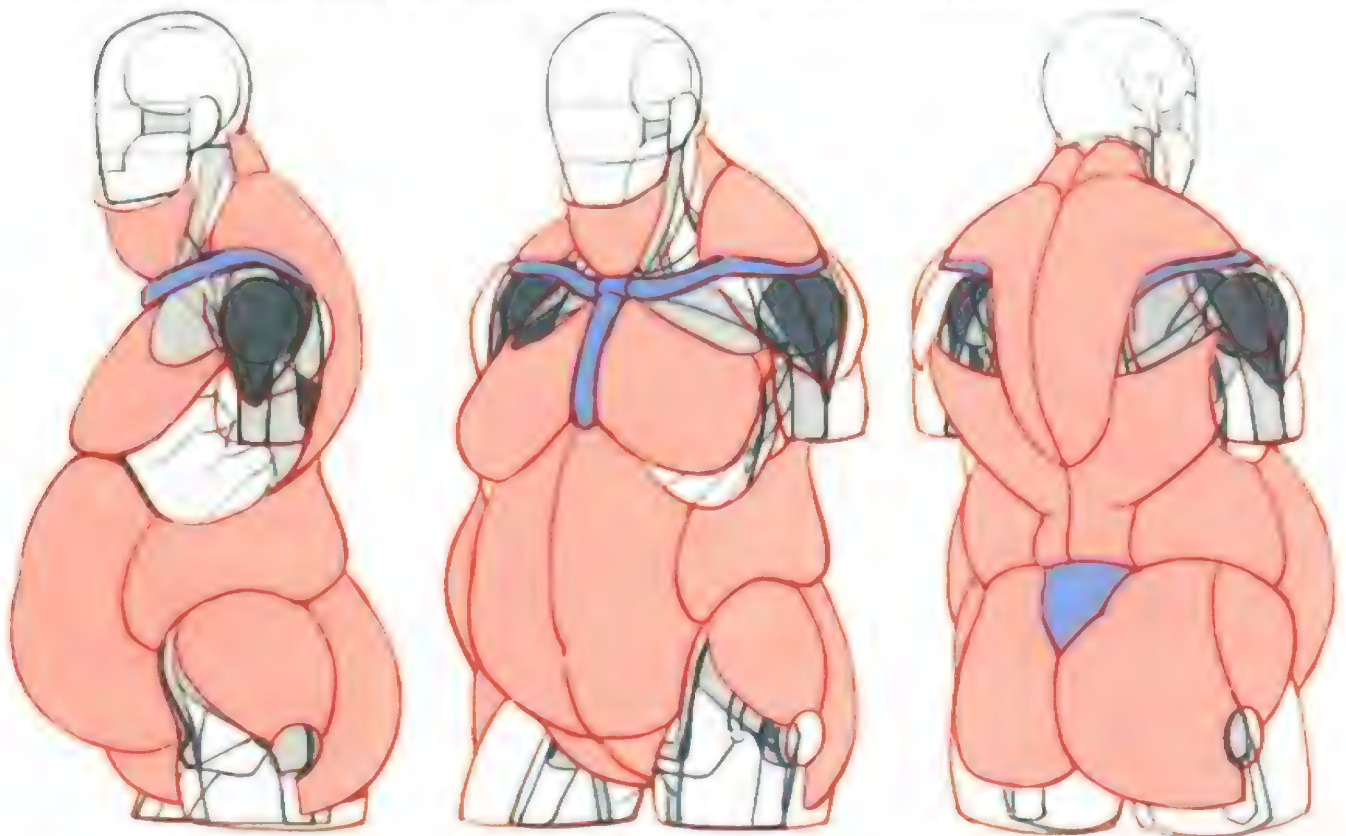
When painting people who are tired, they
 should be Draw some thinner muscles on the bone road The
 meat group try to draw as much as possible at some bone
 points The basic structure of the bone grid is drawn like this
 People who come will look thin



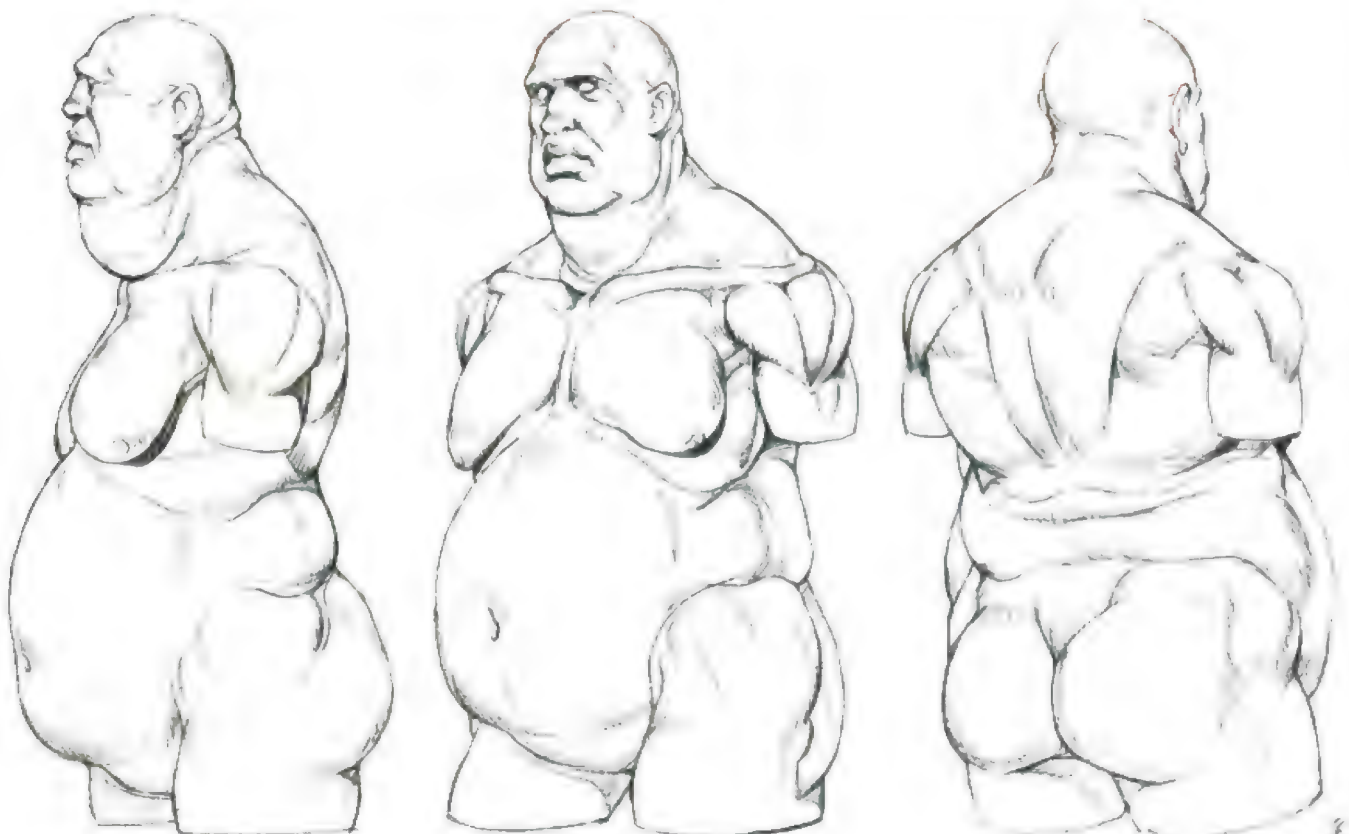
When painting a figure sketch, it is necessary to make 30-40% of the character recede into the background, and not the prominent part of the body give the impression of being a mere watermark, causing the viewer to lose interest.

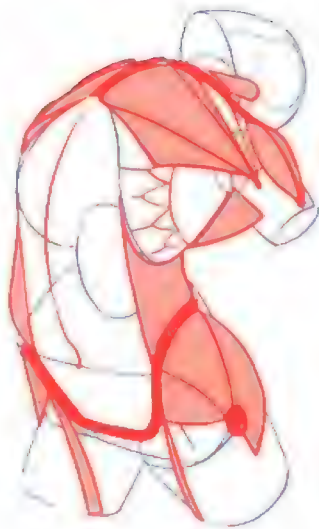


(i) The fat of latter pecula is soft and affected by gravity. When these fats burge out, they will droop, hanging on the bones like water balloons.



When drawing the people of this country, it is necessary to know the fat of their bones, and to draw the bones of the skeleton of the body, and to draw the muscles and the nerves, and to draw the veins and the arteries.





When people who are drunk exercise, the fat on their bodies will be pulled and squeezed with the bone combs, and these fats will bulge outside the bone combs.

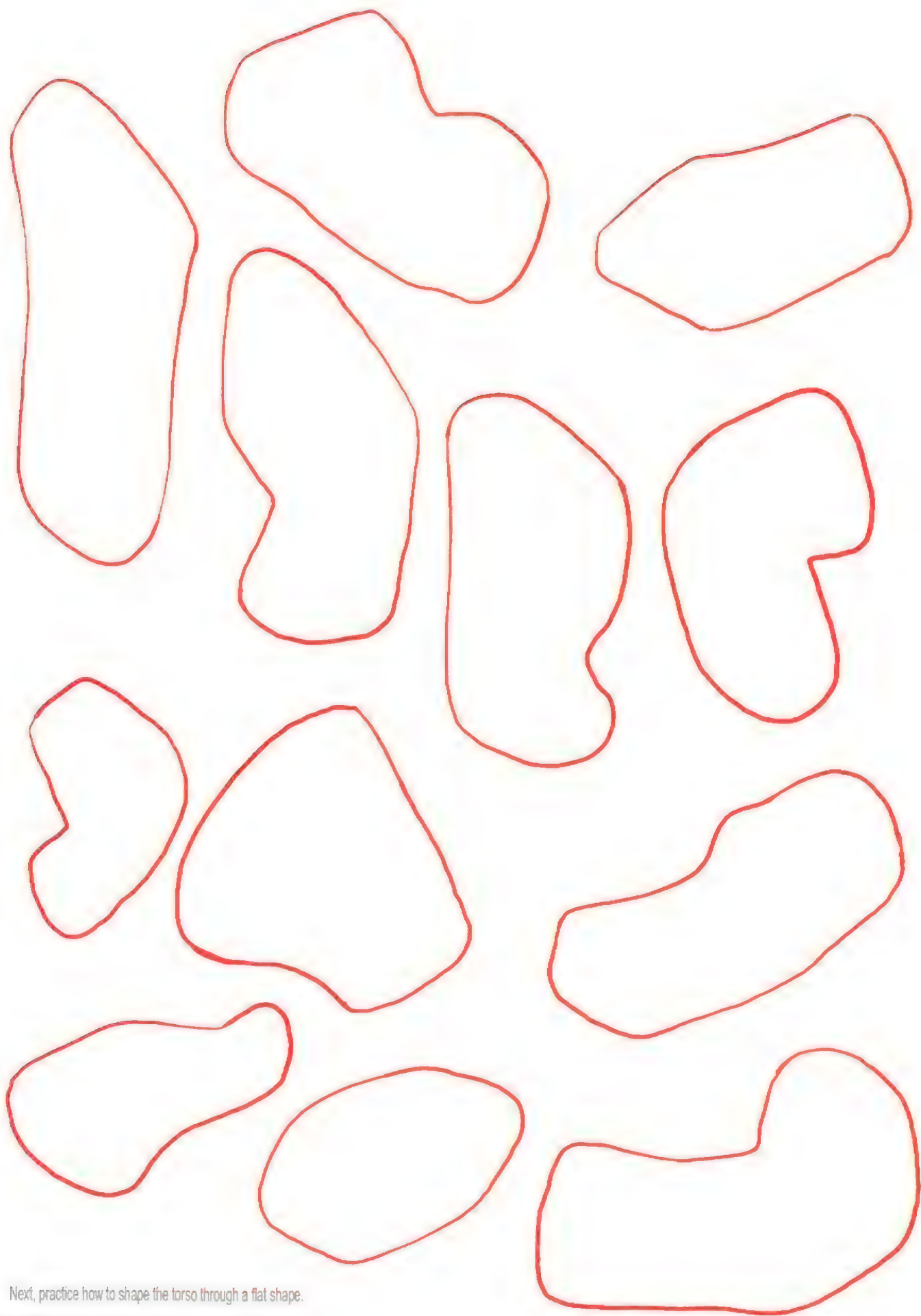
07

THE DRAWING STEPS OF THE TRUNK



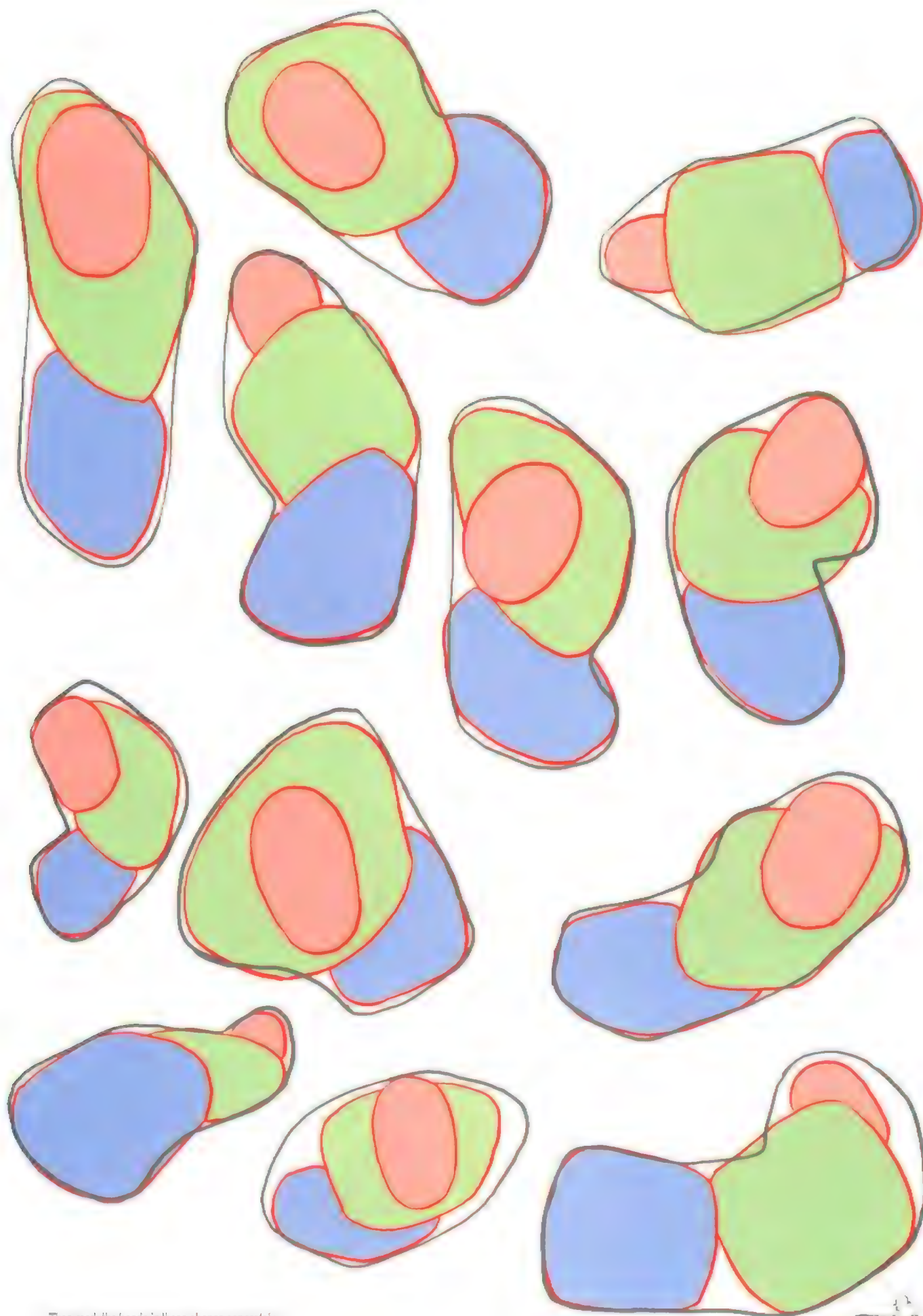
Here is a diagram of the drawing steps of the torso. We can refer to these steps to draw a perspective torso. After grasping the spatial relationship of the neck and the drawing method of human bones and muscles, we will be more comfortable when we paint the human body in the future.





Next, practice how to shape the torso through a flat shape.

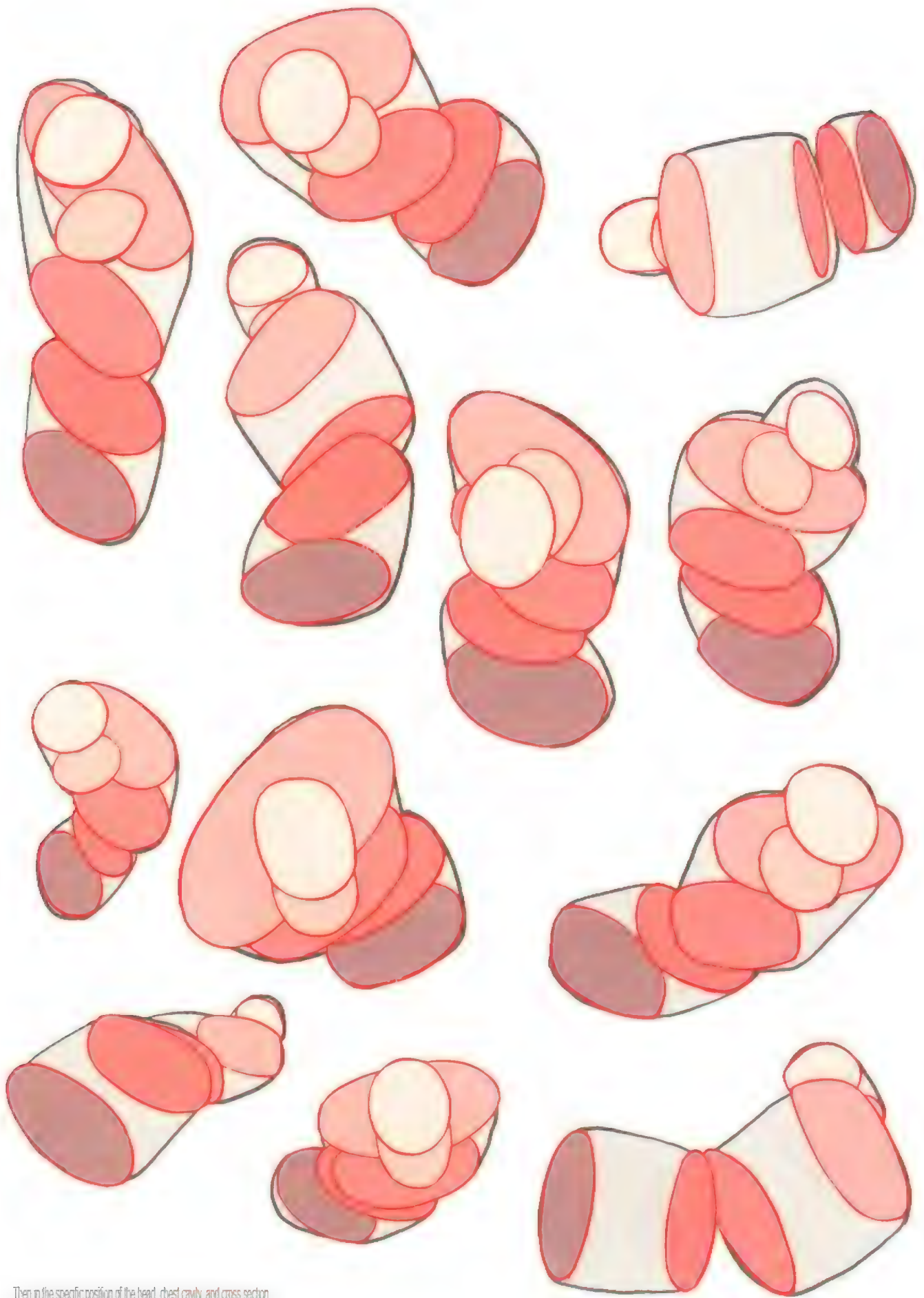
| First draw different shapes with spacing on a blank piece of paper.



Then mark the heads in these shapes separately.

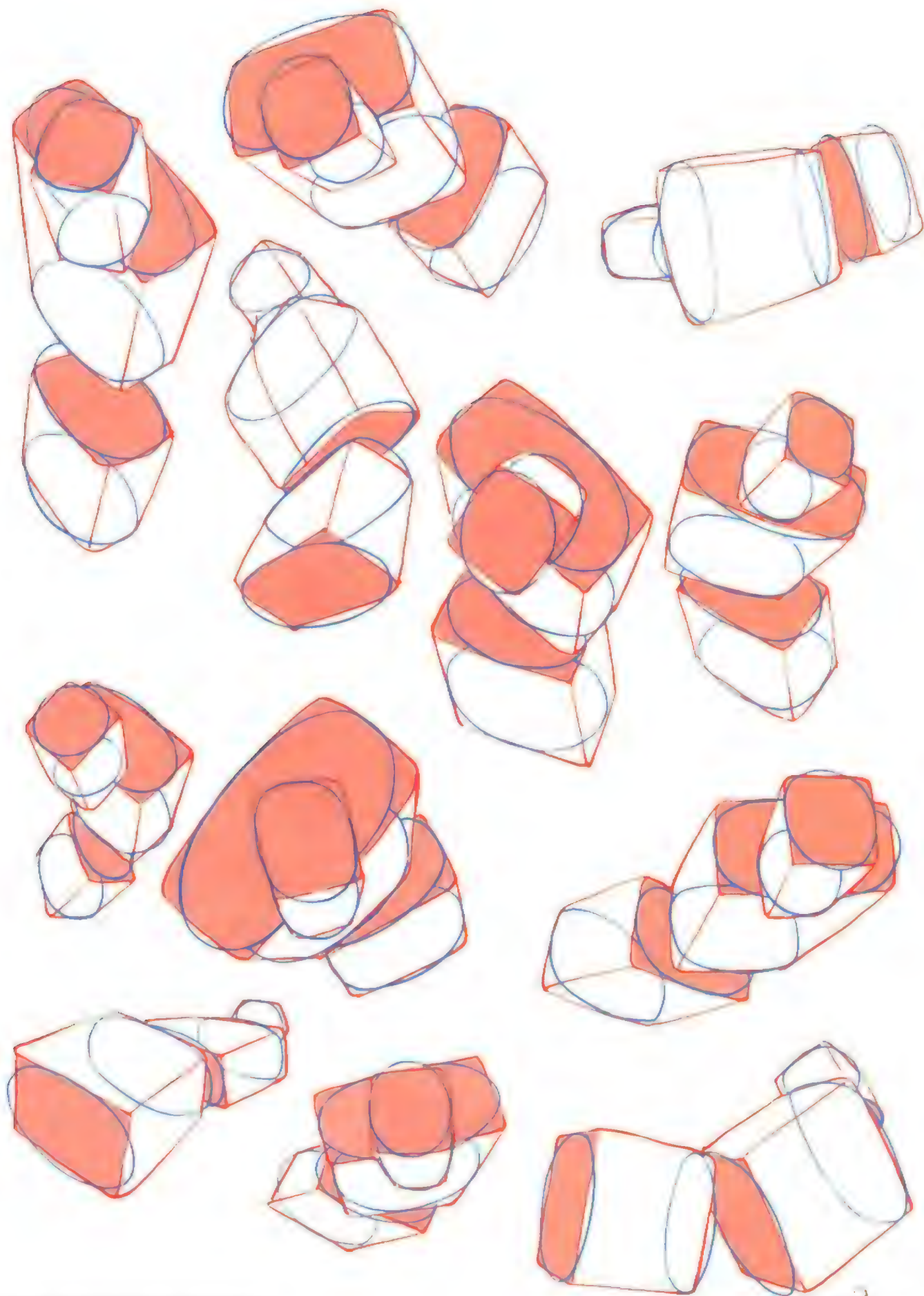
The specific location of the chest cavity and cross section





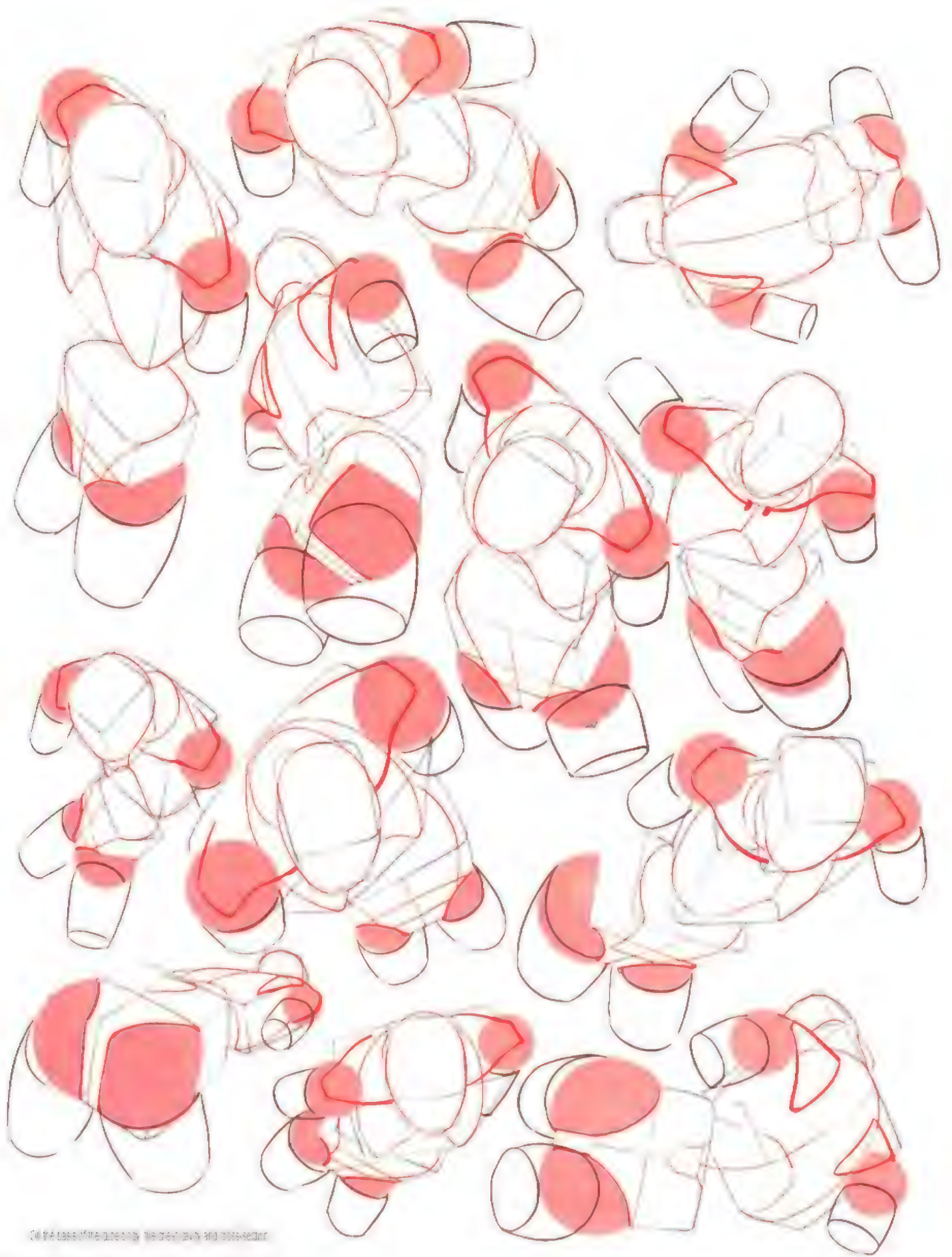
Then in the specific position of the head, chest cavity, and cross section
 Set the shape to create the round facets of these parts and make them change

Then in the specific position of the head, chest cavity, and cross section



Cut round facets and cut them into square faces,
Increase their thickness and turn them into squares with reasonable perspective

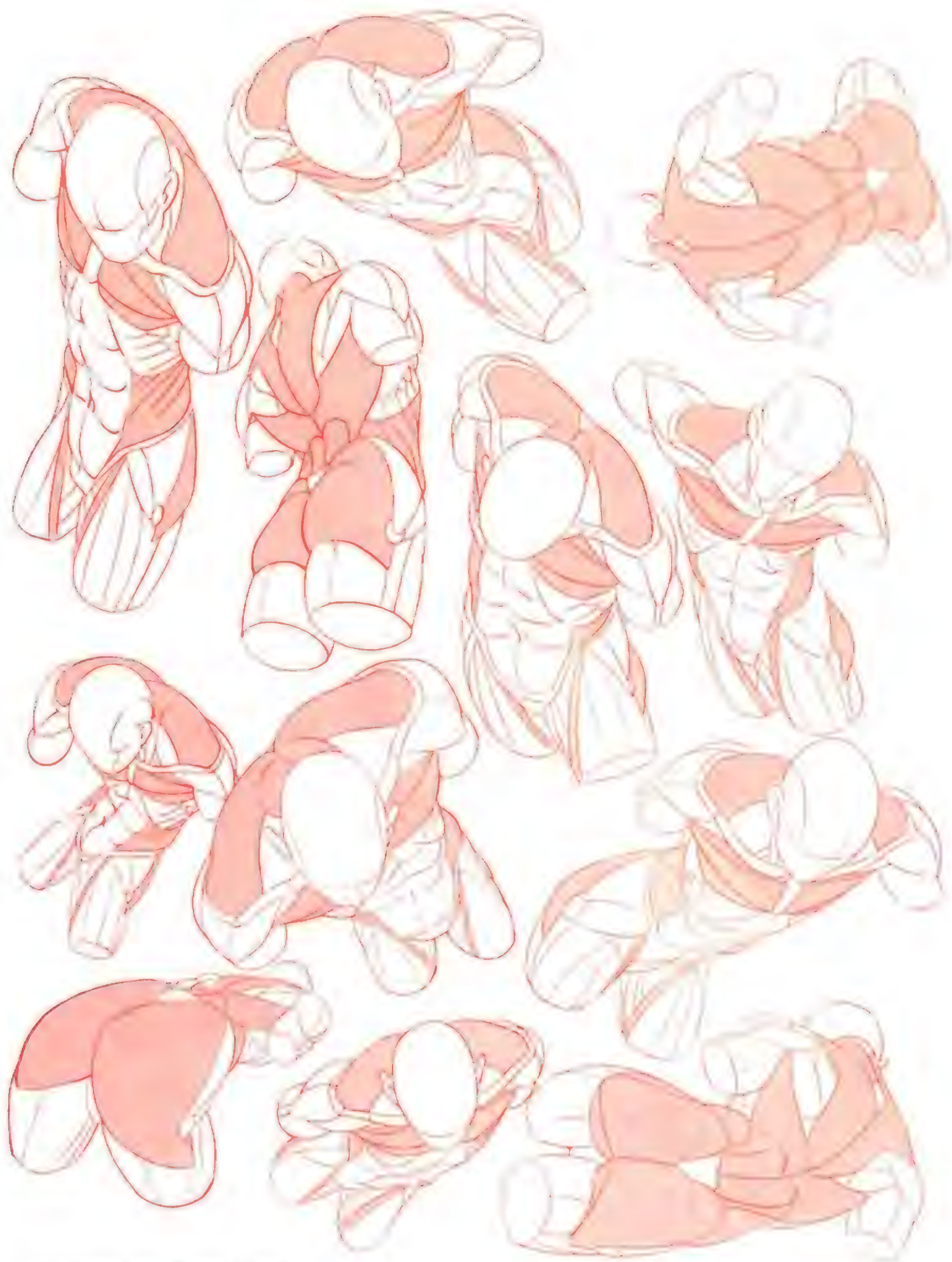




On the basis of the drawing, the artist's body and mass-center

To shape, use clips and spheres at the same time, and .

The cylinder clearly explains the perspective state of the human limbs.



Continue basic of these brackets with a sense of space 400

Add the corresponding muscles and refine the lines on the bracket.

You can shape different corners through the shape of the plane

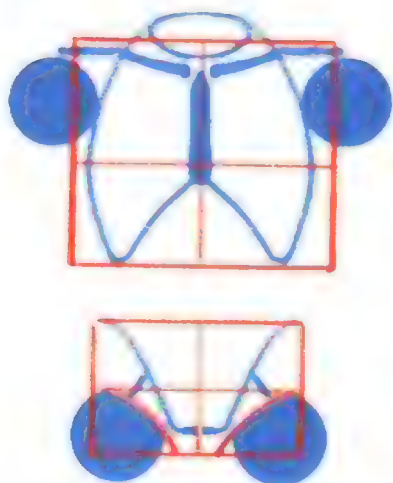
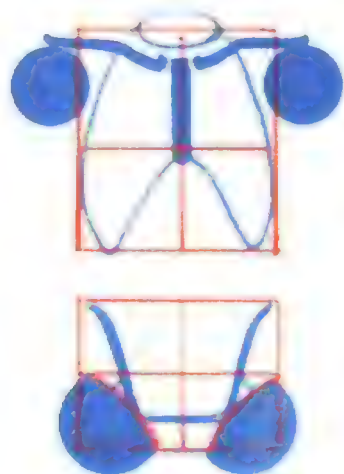
Degree of drying



08

·Drawing steps for the adaptability and use of the torso

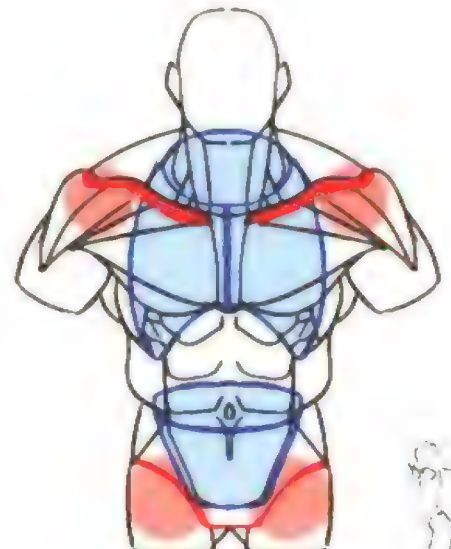
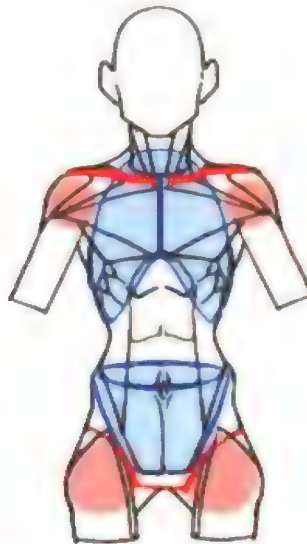
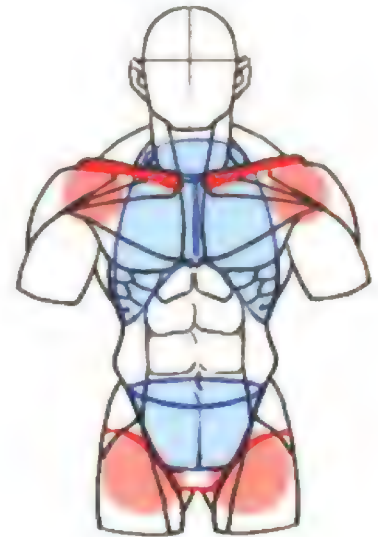
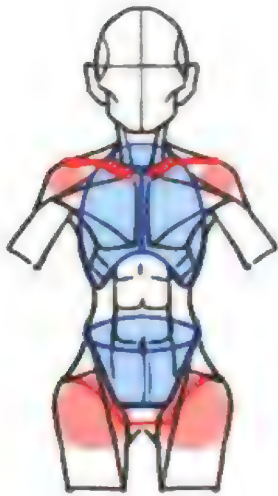
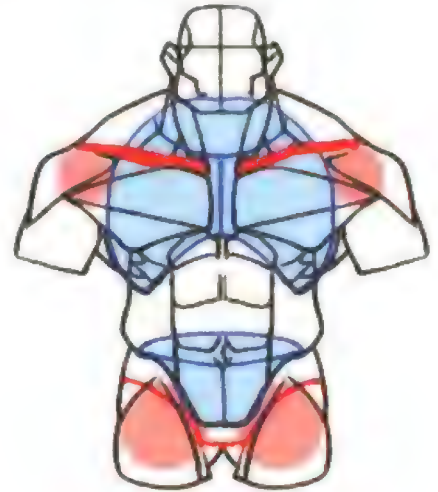
We can flexibly use the proportional changes of the human body bracket to shape anime characters of different body shapes.

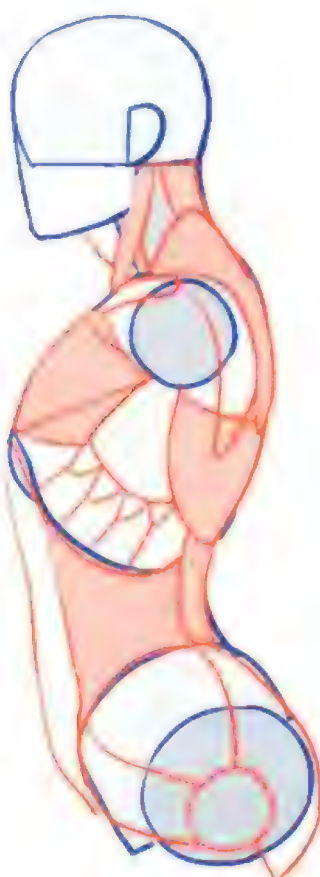
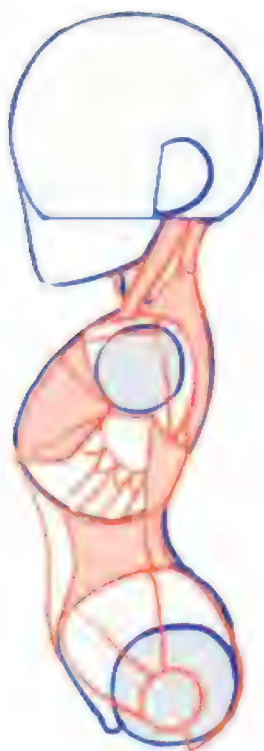


The differences between the three types of human torso are: the first type is the most common, the second type is the most beautiful, and the third type is the most powerful. The differences between the three types are determined by the three factors of the body: the first factor is the body shape, the second factor is the body color, and the third factor is the body texture.

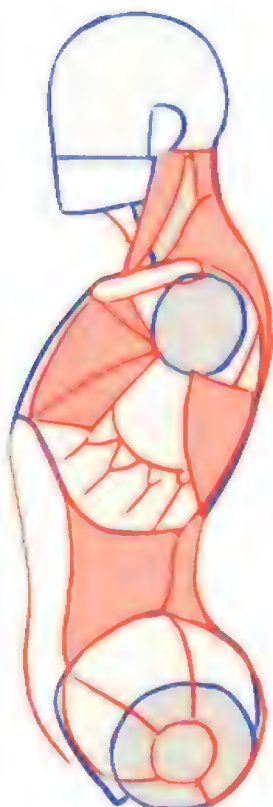
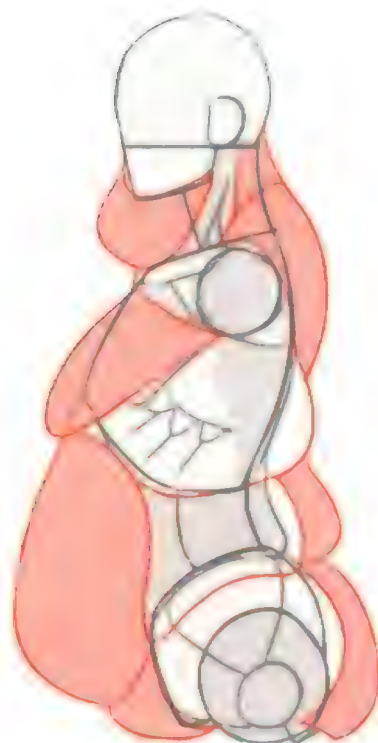
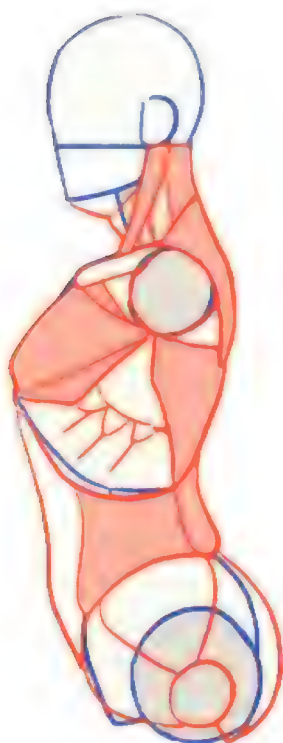
The differences between the three types are determined by the three factors of the body: the first factor is the body shape, the second factor is the body color, and the third factor is the body texture. After we understand the structure of the torso, we can make them more beautiful.

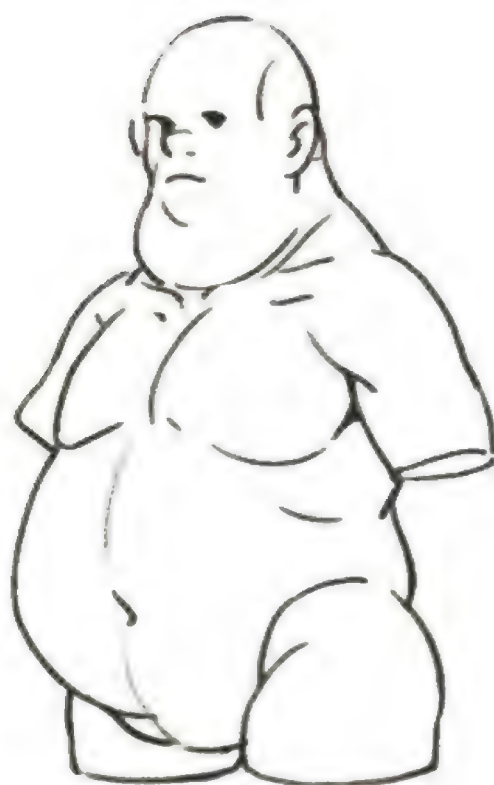
Different human torsos.



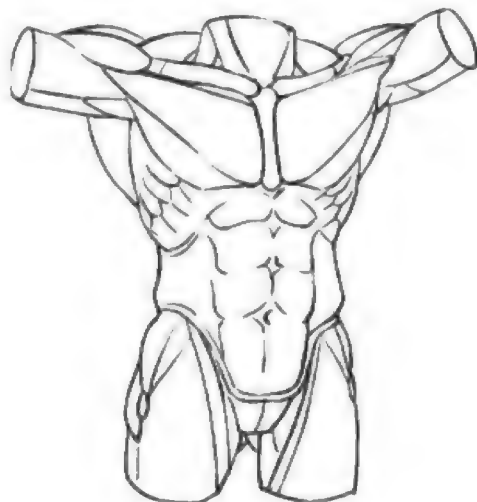
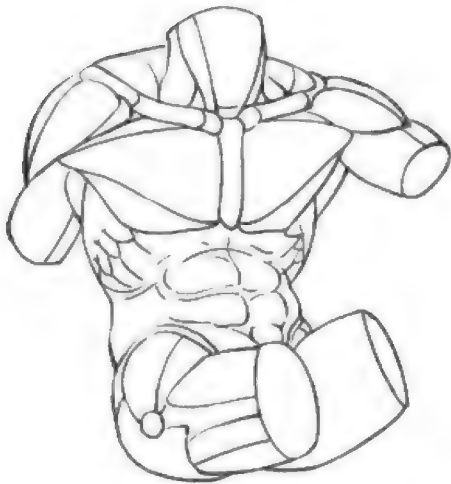
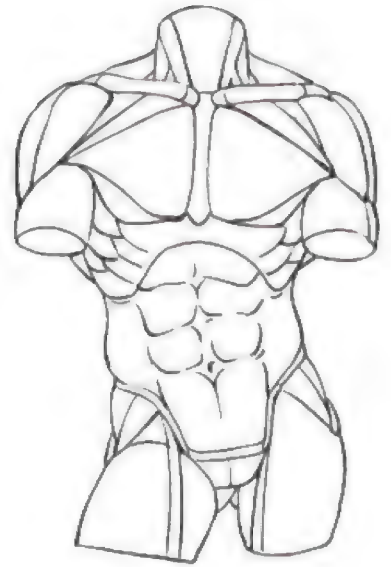








When we do muscle drawing exercises, we can enhance the muscle structure of some other area. What is it? Just need to choose the working state of the skeleton.



When the practice of making the torso drapery reaches a certain level of proficiency, the torso can be shaded by sketching.



The background of the page is a solid green color. Overlaid on this background are several line art illustrations of a character, likely a superhero, in various dynamic poses. The character is depicted from the waist up, wearing a suit with a harness-like structure. The poses include: a character with arms raised and legs spread in the top left; a character with one arm raised and the other extended in the top center; a character in a crouching, forward-leaning pose in the top right; a character with arms spread wide in the middle left; a character with both arms raised in the middle center; a character in a crouching, forward-leaning pose in the middle right; a character with arms spread wide in the bottom left; a character with one arm raised and the other extended in the bottom center; and a character in a crouching, forward-leaning pose in the bottom right. The text 'Chapter Four' is located in the bottom left corner, written in a white, serif font.

Chapter Four

Limb structure

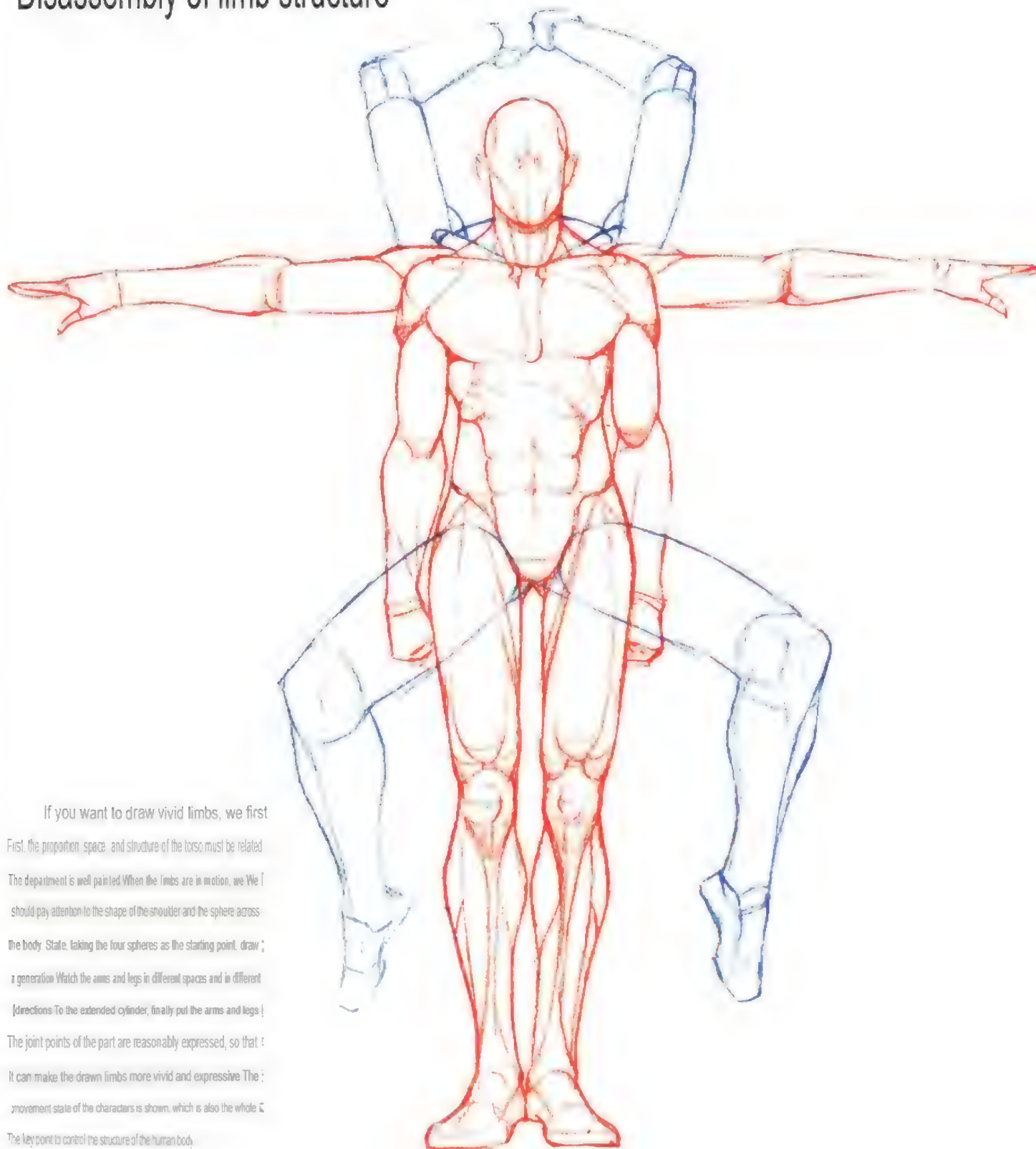
四肢结构

第四章

- 1. 四肢的骨骼
- 2. 四肢的肌肉
- 3. 四肢的神经
- 4. 四肢的血管
- 5. 四肢的淋巴管
- 6. 四肢的结缔组织
- 7. 四肢的内分泌
- 8. 四肢的免疫
- 9. 四肢的发育
- 10. 四肢的衰老
- 11. 四肢的损伤
- 12. 四肢的修复
- 13. 四肢的再生
- 14. 四肢的移植
- 15. 四肢的再造
- 16. 四肢的假肢
- 17. 四肢的矫形
- 18. 四肢的康复
- 19. 四肢的保健
- 20. 四肢的预防

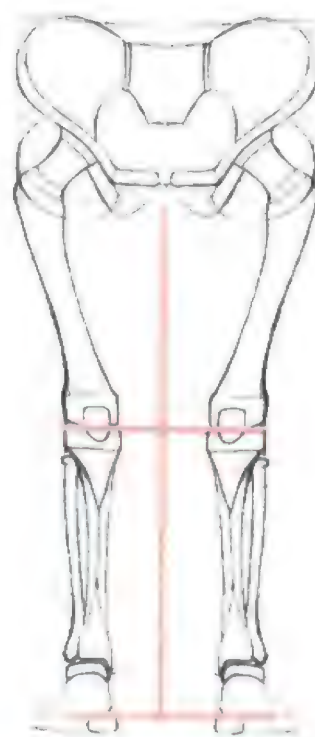
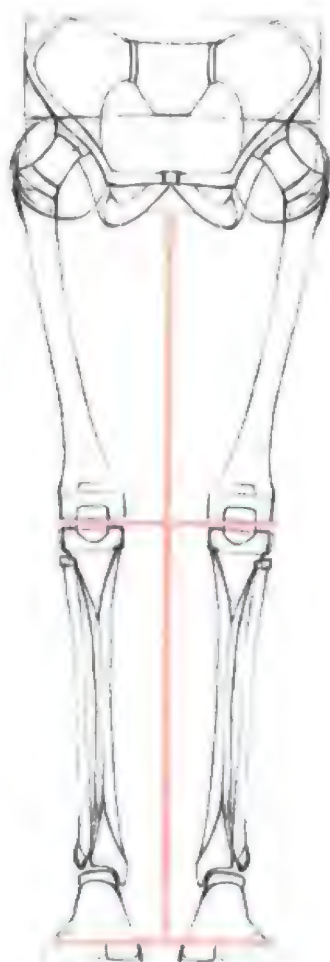
01

Disassembly of limb structure



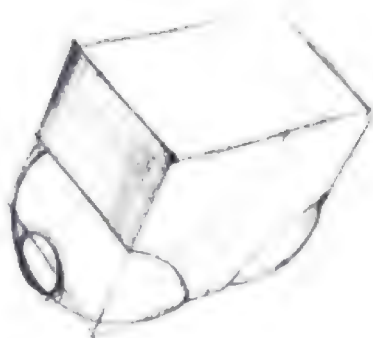
If you want to draw vivid limbs, we first
First, the proportion, space, and structure of the torso must be related
The department is well painted. When the limbs are in motion, we
should pay attention to the shape of the shoulder and the sphere across
the body. State, taking the four spheres as the starting point, draw
a generation. Watch the arms and legs in different spaces and in different
directions. To the extended cylinder, finally put the arms and legs.
The joint points of the part are reasonably expressed, so that
It can make the drawn limbs more vivid and expressive. The
movement state of the characters is shown, which is also the whole
The key point to control the structure of the human body.

The proportion of the lower body of the human body can be quickly divided.
Come out and pull from the top of the leg to the ground between your legs. A
straight line divides the straight line in two, and the knee joint is just right.
At one-half of the straight line.



The vertical line of the human body is divided into three parts: the head, the torso, and the legs. The torso is divided into two parts: the upper torso and the lower torso. The legs are divided into two parts: the upper leg and the lower leg. The proportions of these parts are expressed in the state of motion.

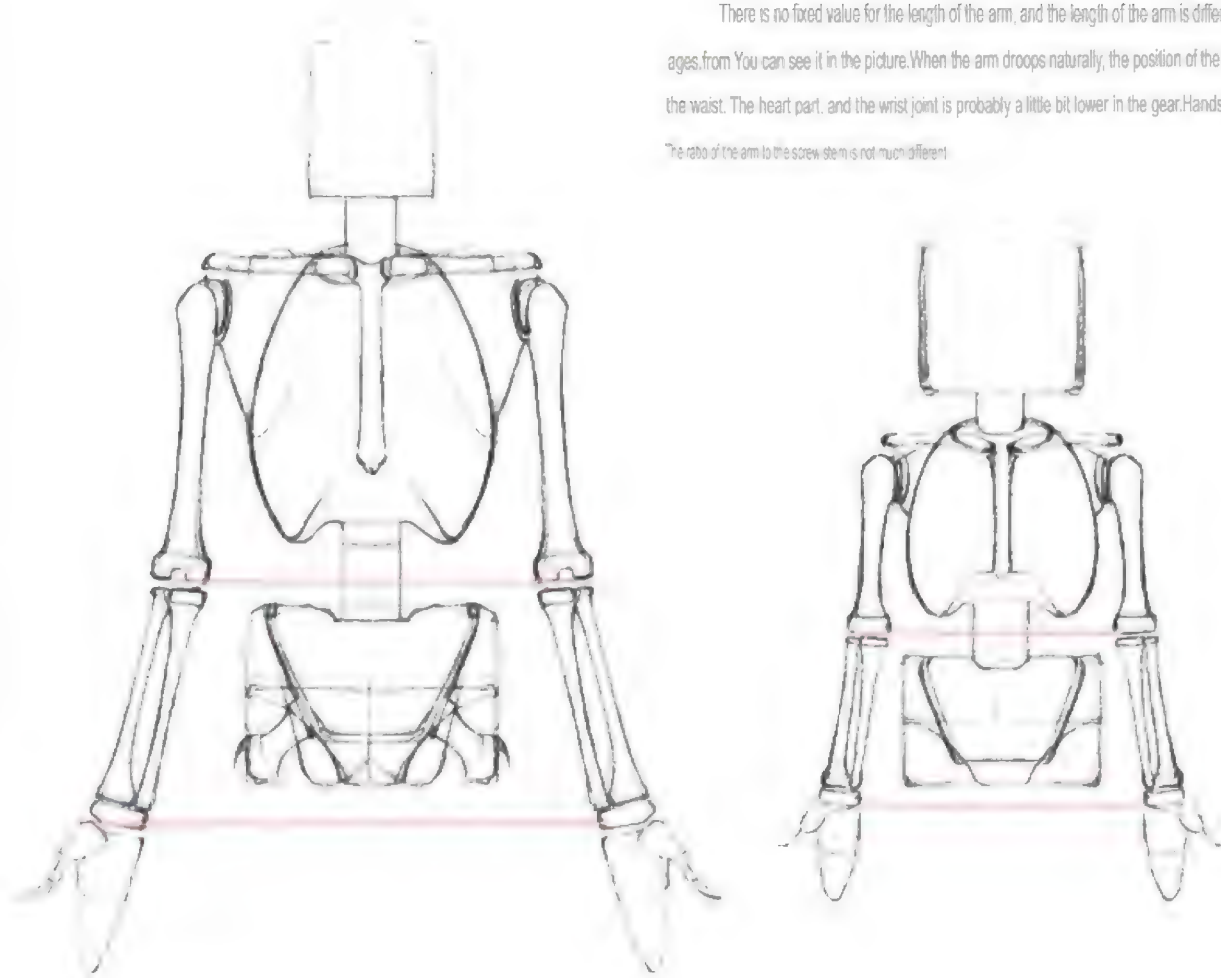
The spatial relationship between them is expressed in the state of motion.



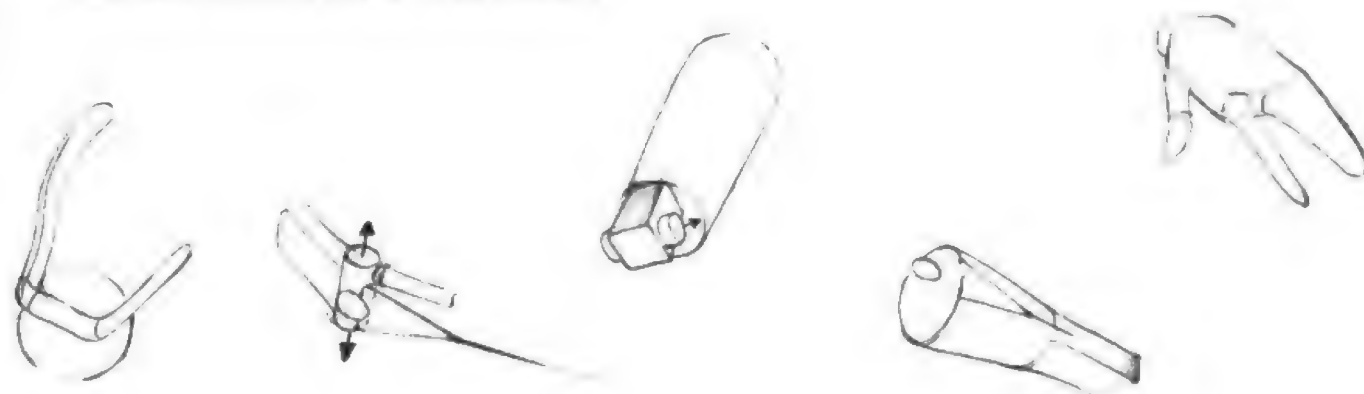
02

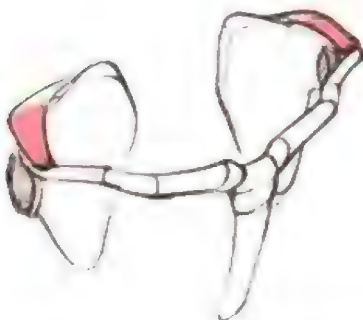
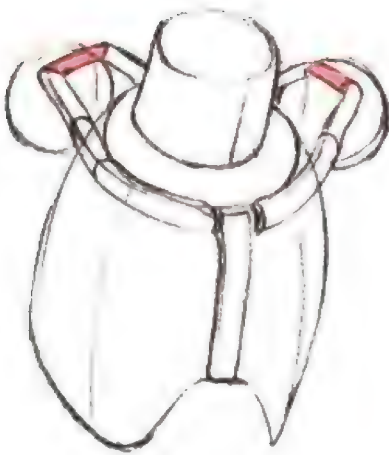
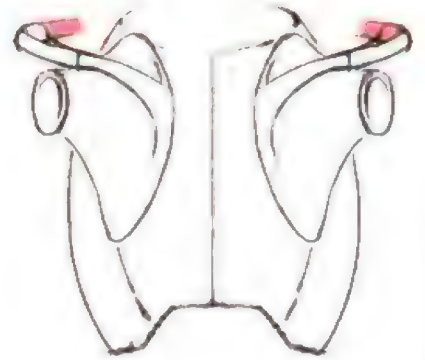
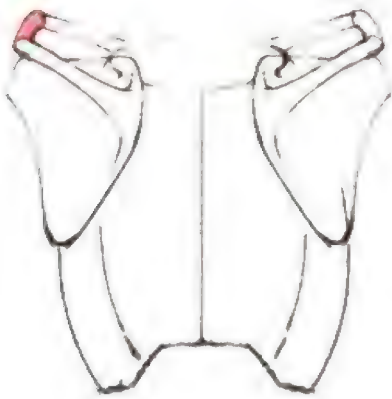
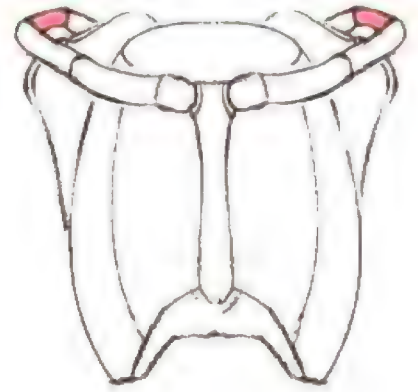
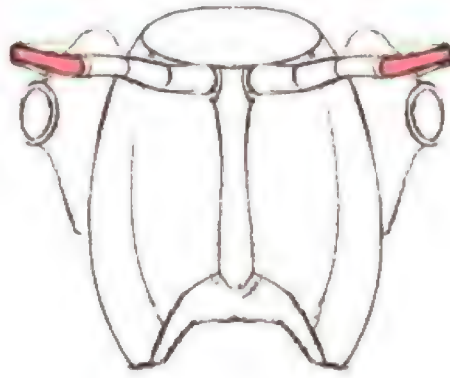
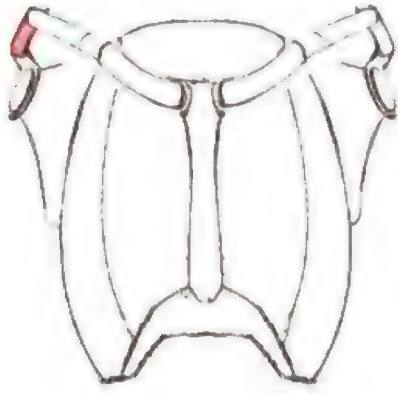
Structure of shoulder service

There is no fixed value for the length of the arm, and the length of the arm is different for people of different ages. You can see it in the picture. When the arm droops naturally, the position of the joint is probably in the middle of the waist. The heart part, and the wrist joint is probably a little bit lower in the gear. Hands of people of different ages. The ratio of the arm to the screw stem is not much different.



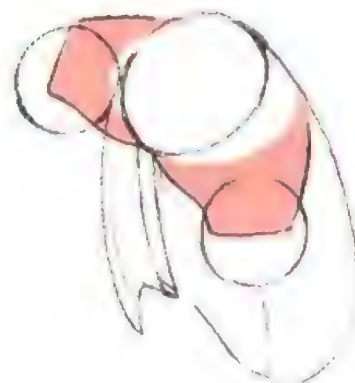
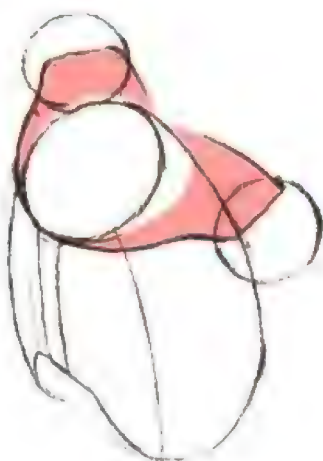
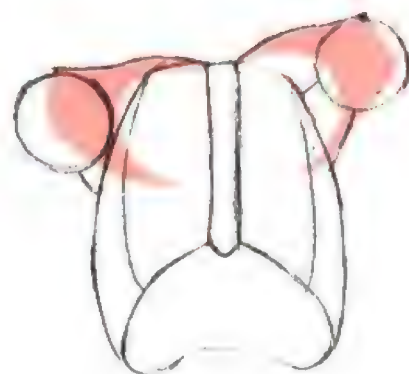
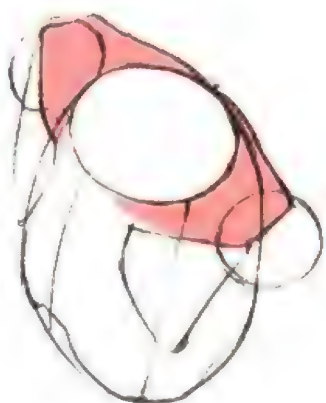
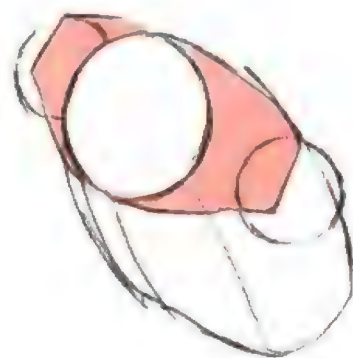
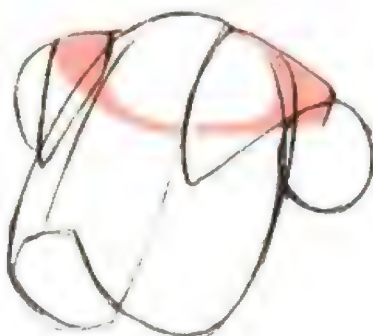
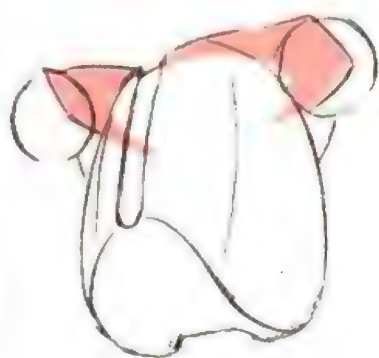
The upper arm is divided into three parts: the upper arm, the elbow, and the forearm.



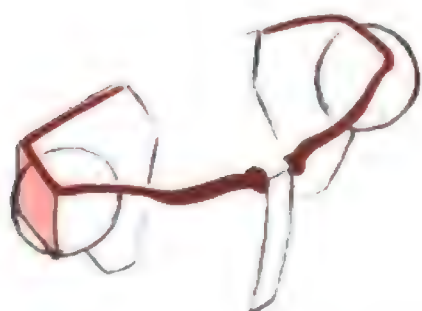
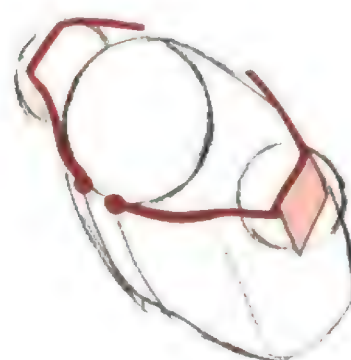


The structure of the shoulder can be seen as a clip, clamping the chest cavity and swinging around. The most important thing to shape the clip is to express the side of the clip.
 [The thickness of the surface, when the clip moves, the thickness of its side will be different. Just show the thickness of the side well.
 Accurately perform Kai Shing's movements in all directions



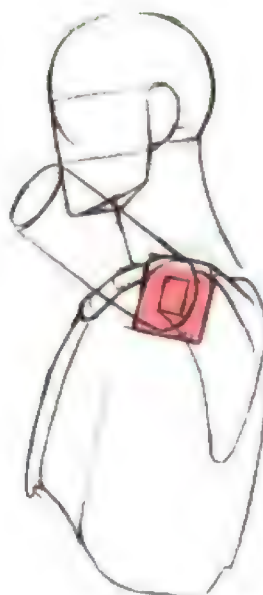
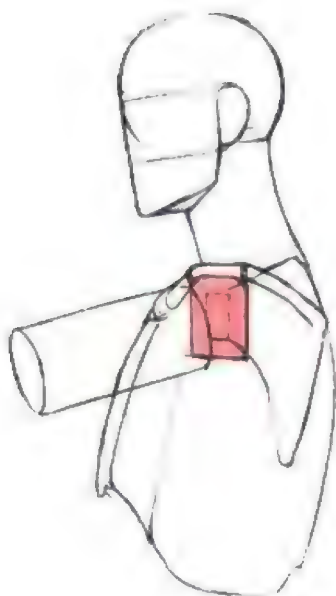
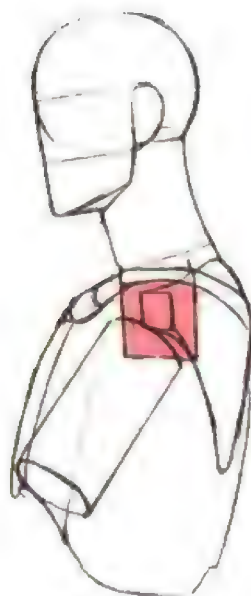
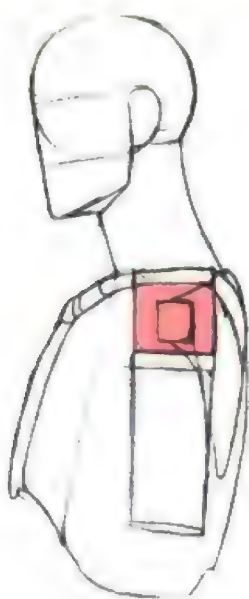


In order to facilitate drawing, we can think of the shoulder shape as a flat shape. When the shoulder moves, it corresponds to the flat shape. The shape of the surface will also be deformed, which is the key point to express the spatial relationship of Kai Sheng. Only Kai Sheng's perspective is reasonable. In order to correctly draw the movement state of the upper arm.

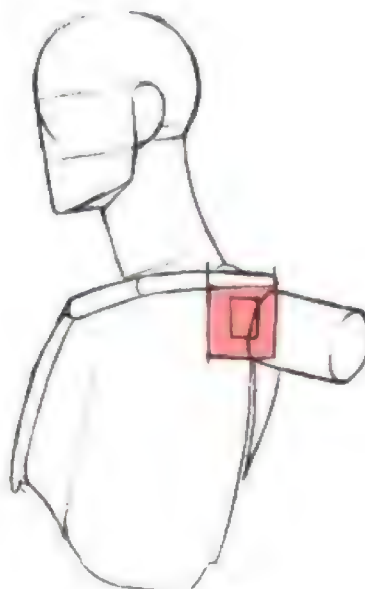
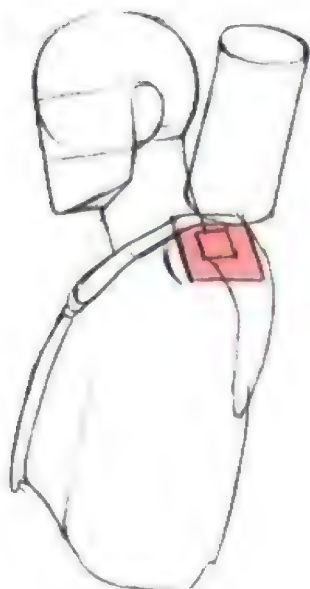


The movement of the shoulder victory changes the connection surface between the hand cone and the shoulder victory. To deal with this change is to draw the three-dimensional space of the shoulder victory. (The main point of the sense of arm is not enough to use the sphere alone to indicate the volume of the starting point of the arm. After adding the quadrilateral surface, the sense of volume of the starting point of the arm is not enough. The structure of the junction between the shoulder and the arm is similar to a box, and the sense of volume of the box can better reflect the three-dimensional spatial effect of the arm.)





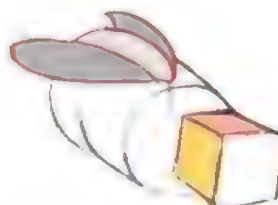
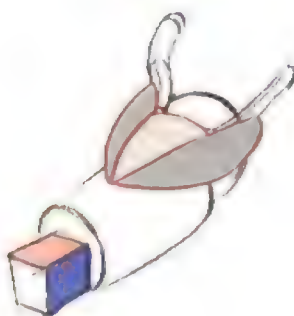
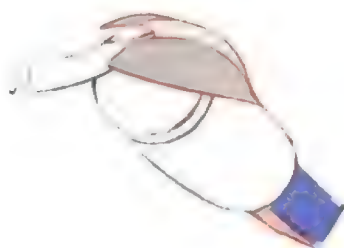
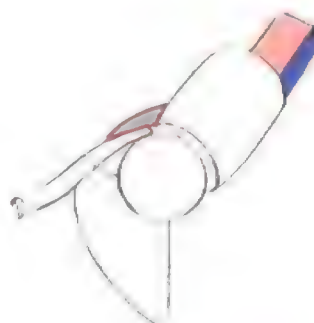
Combining the above knowledge, we can Summarize the real human arm movement How will the shoulder win change, and then Plot these changes.



03

Bones and muscles of the upper arm

For the convenience of drawing, we regard each of the arm bone as a square body, and use yellow, red and blue to represent the front side, and back. Among muscles, we can take the arm bone as a template. The front side and back of the bone are outlined out. The biceps and triceps are in the front of the bone, the coracobrachialis are at the side of the bone, and the brachialis are at the back of the bone. The brachialis are at the back of the bone. Muscles will become simple and relaxed.

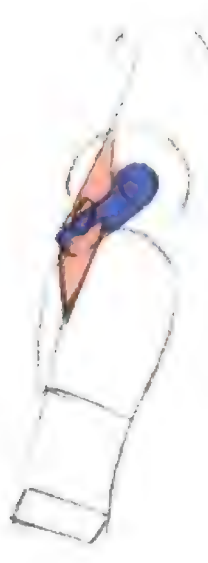


04

Structure of the elbow



When the arm rotates, the bone The whole will be displaced accordingly, and this This kind of displacement will cause the surface of the arm The muscles are deformed, so we You should understand the muscle relationship before expressing it. The state of rotation of the bone path



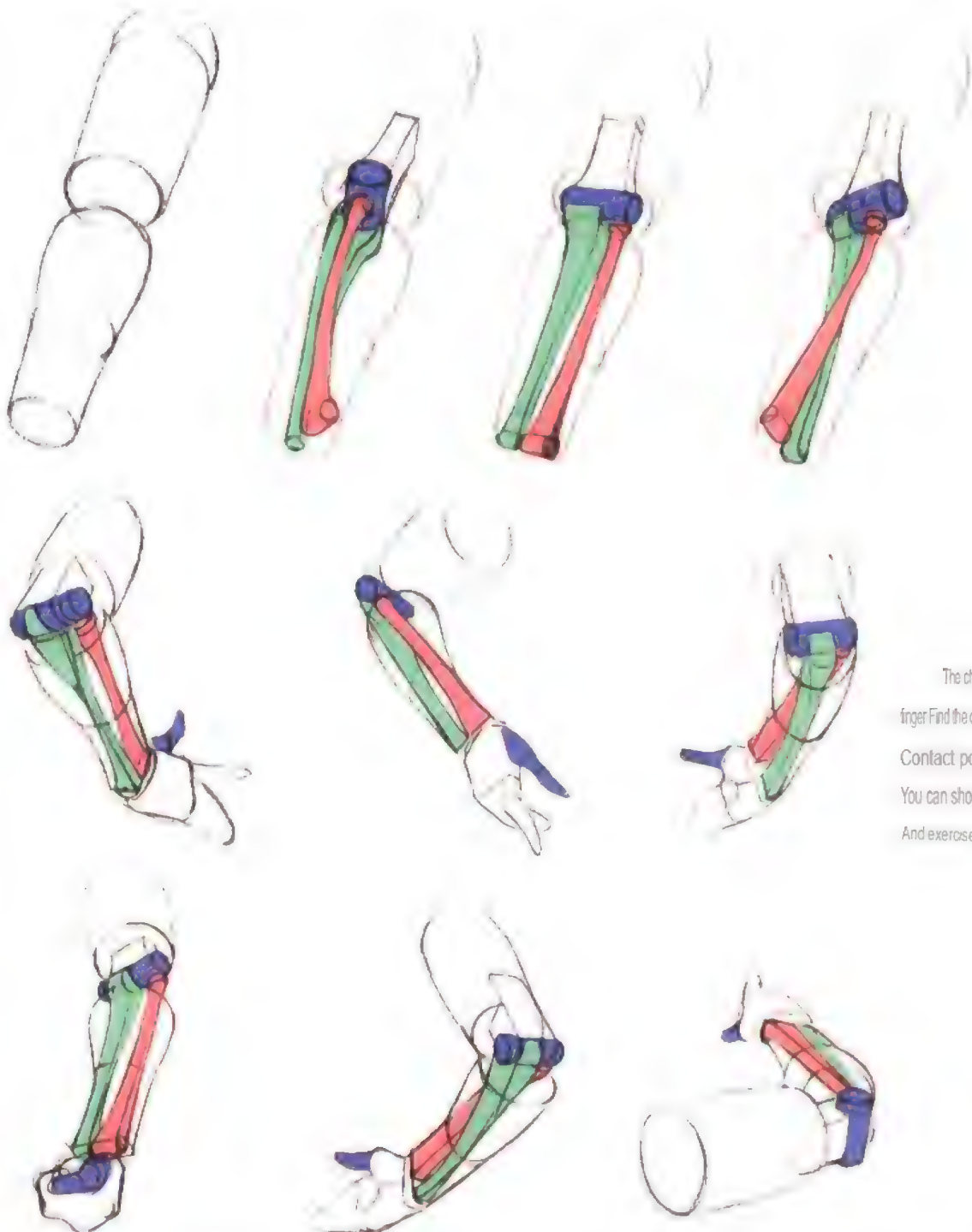
Draw the off of the rotating arm One of the keys is to express the elbow joint. elbow Joints can be seen as triangles and circles The combination of cylinders, when the arm rotates Both of these will also rotate according to the arm The angle has changed. Analysis circle. The specific perspective state of the cylinder, and then Then arrange three on the side of the cylinder The angular position makes the two unified Cooperate, we can draw well The state of movement of the time-out part



05

'Bone structure of the forearm

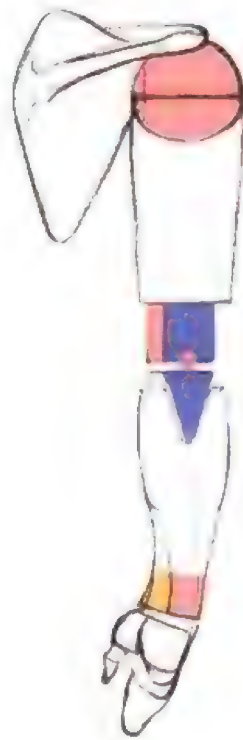
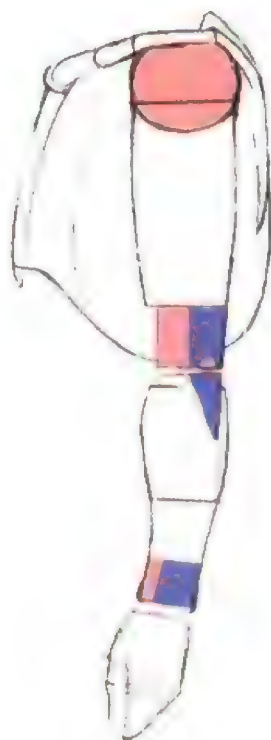
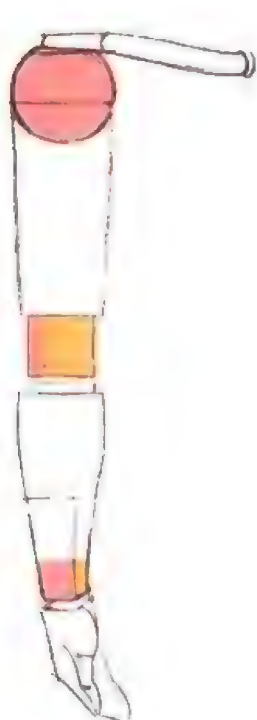
The bone felus of the forearm is composed of the ulna and the turning bone. The ulna is fixed to the brain bone, and the turning bone can be moved and changed according to the torsion of the arm.



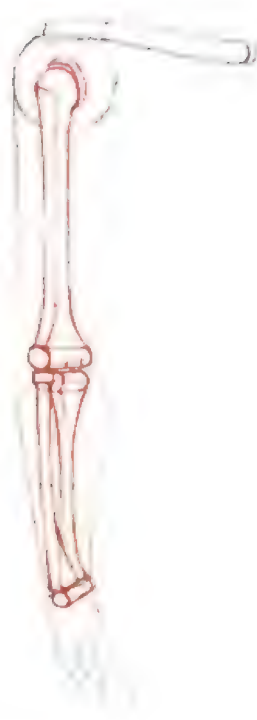
The change of the German bone depends on the big finger. Find the connection between the ulna and the elbow joint. Contact point, connect it to the big finger. You can show the turning point of the forearm well. And exercise.

06

Main points of drawing arm structure



Want to get acquainted with the arm structure as soon as possible. When we give the system, we can practice in stages. First master the geometry of the arm. Think of the arm as a cylinder and a square body. Use simple geometry to explain the space of the arm relationship.

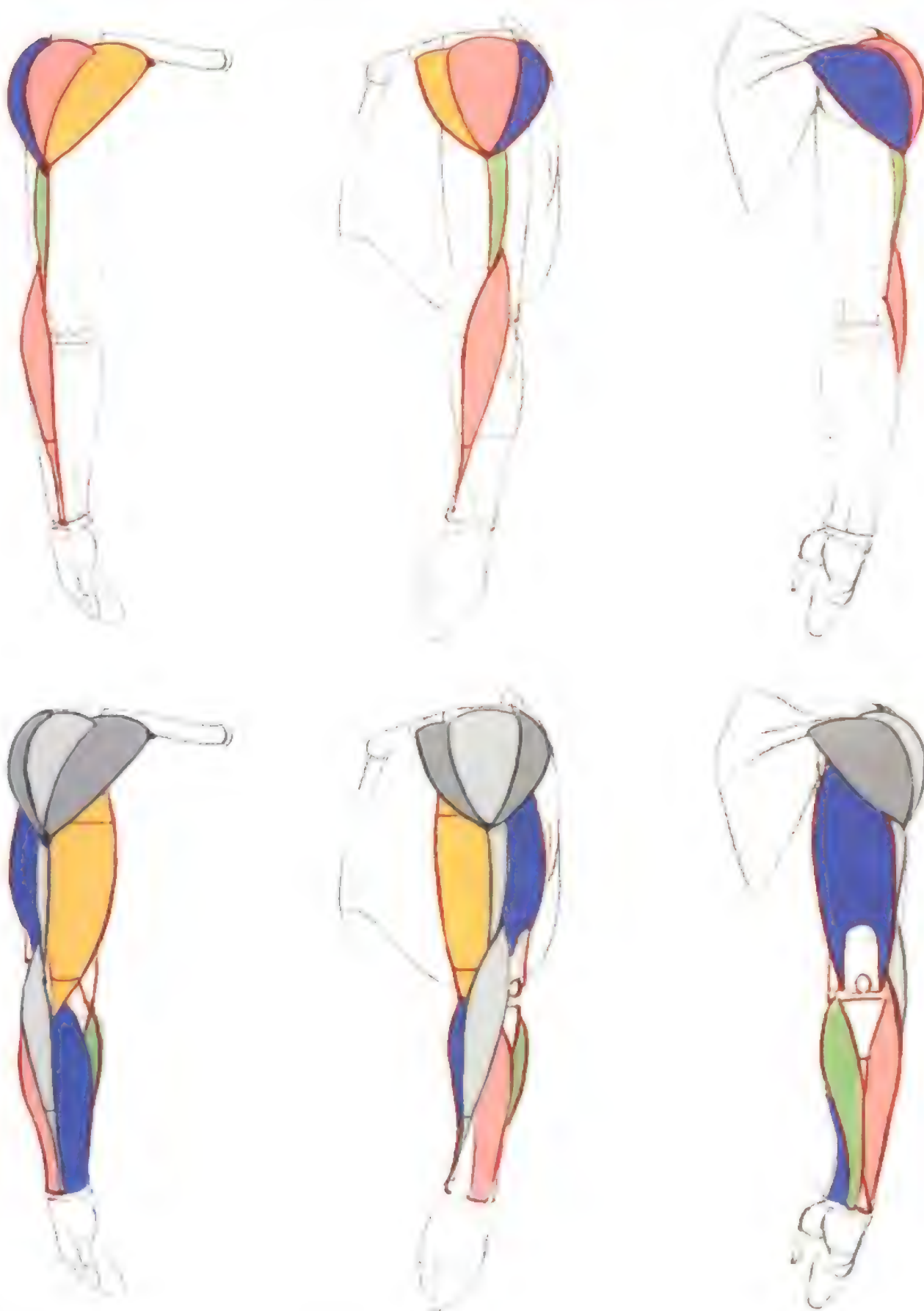


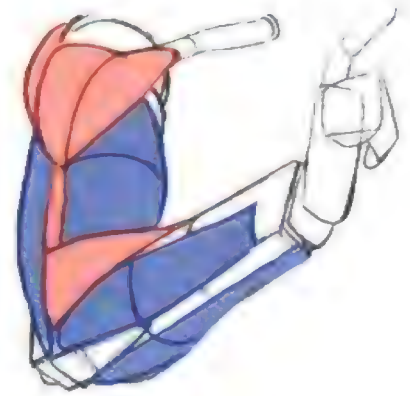
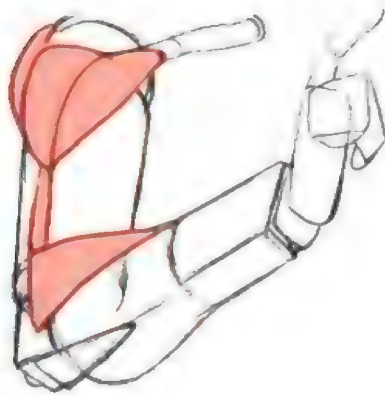
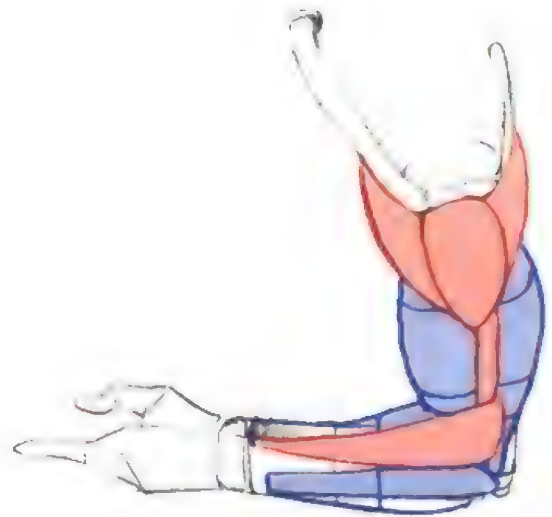
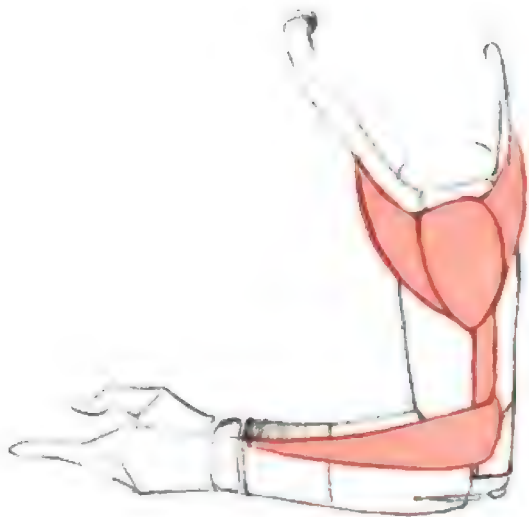
Have a certain spatial relationship with the arm. After cognition, we will understand the bones of the arm. Focus on understanding when the joints and wrist joints are in changes that occur during exercise.



The next step is to add muscles. After focusing on the deltoid muscles, silent muscles, and brain burning muscles, it will be easy to add other muscles.

The way to add the rest of the muscles of the arm is to stack the previous three muscles left and right, so that the structure of the muscles of the arm can be easily, quickly and attractively drawn.



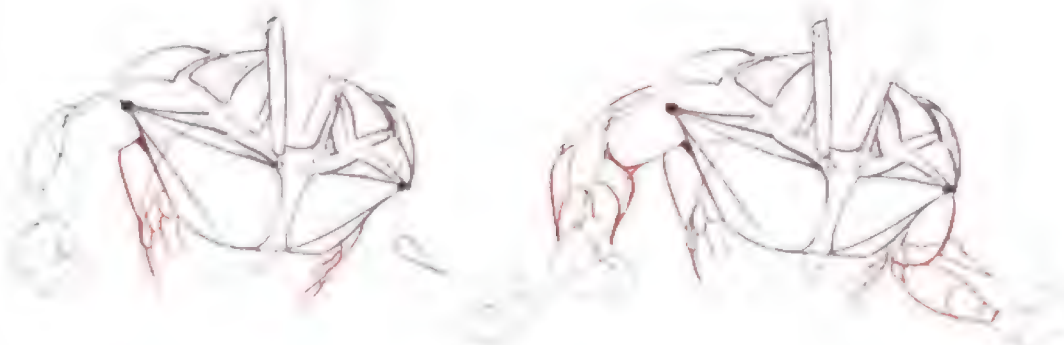
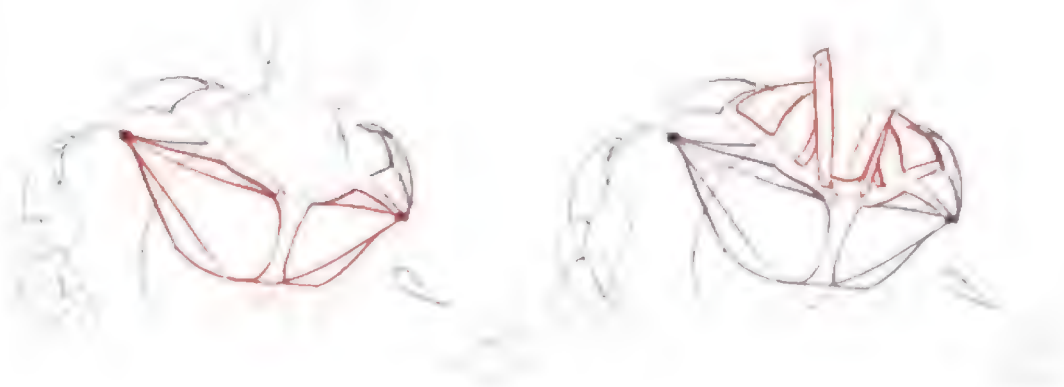


Want to quickly express the muscles on the arm
 Meat, we can do exercises like this:
 First draw the key muscles on the arm clearly
 Chu, then add the rest of the muscles.
 So we don't get too entangled in a certain piece
 The specific movement state of the muscles

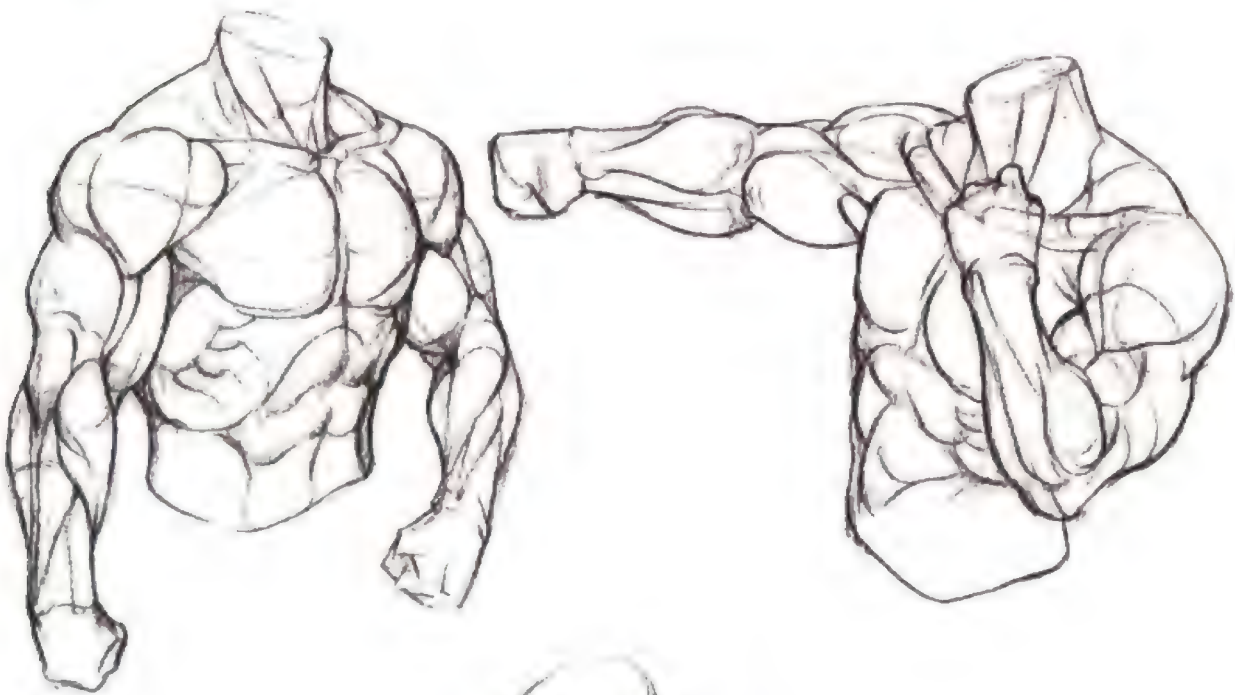
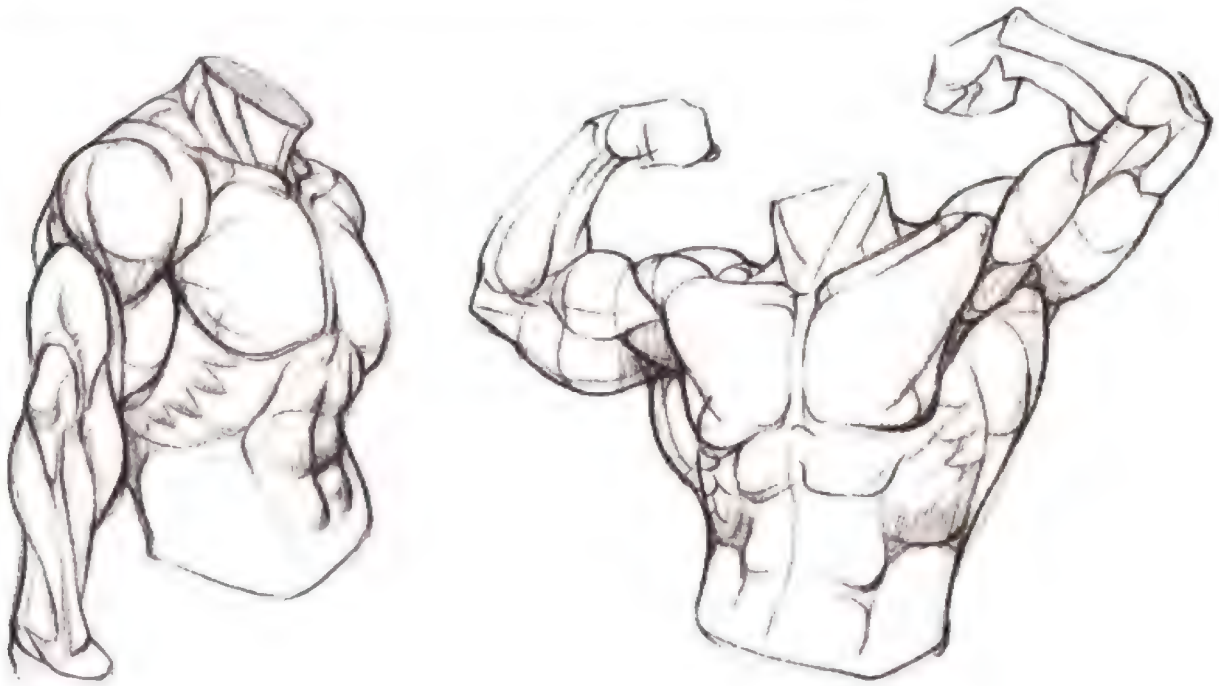
07

Arm drawing exercises

When doing arm drawing exercises, we can gradually draw the upper body through the following steps.

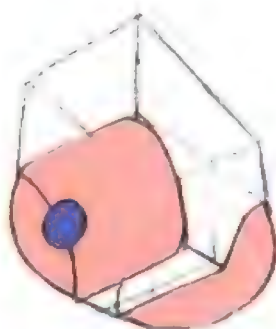
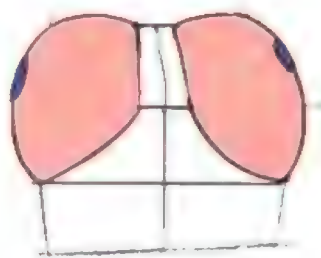
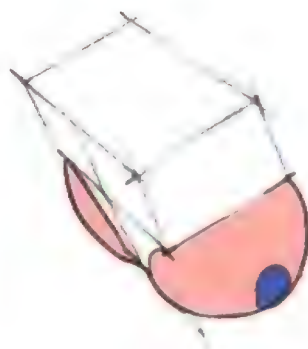
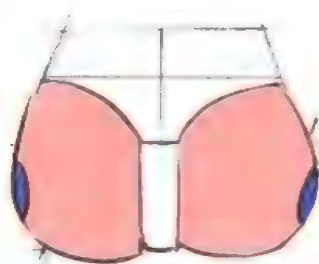
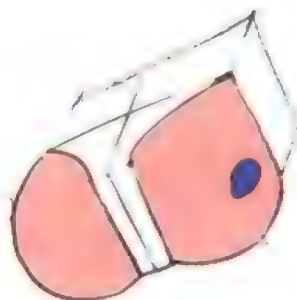
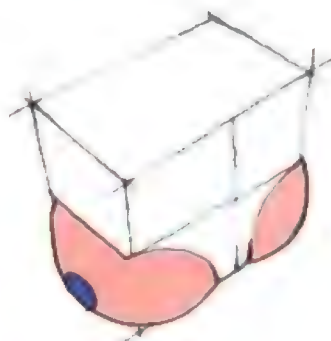
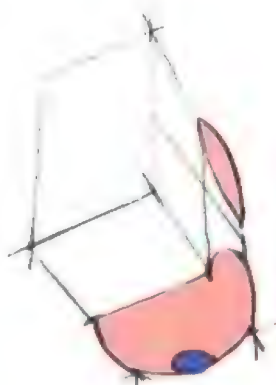
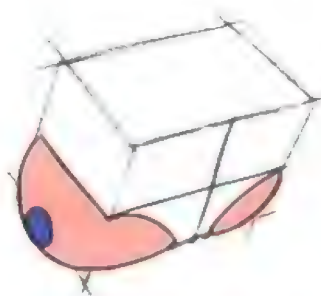
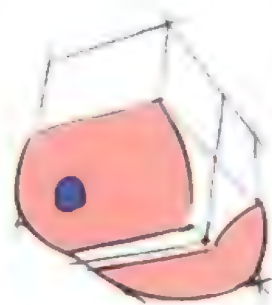


In order to quickly grasp the structure of the arm in the upper body, it is best for us to become familiar with the shape of the arm in different states by observing the real human body in life.

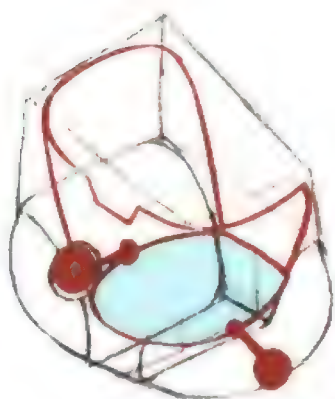
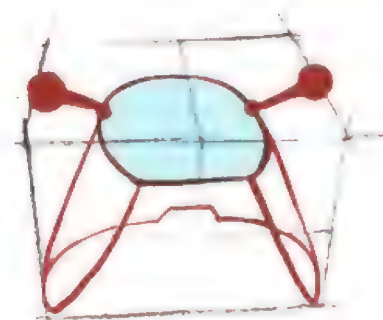
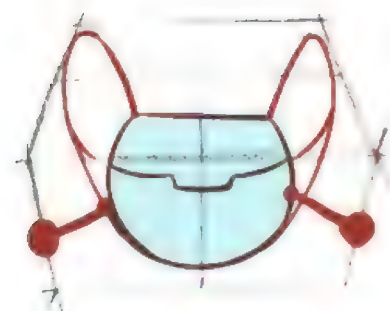
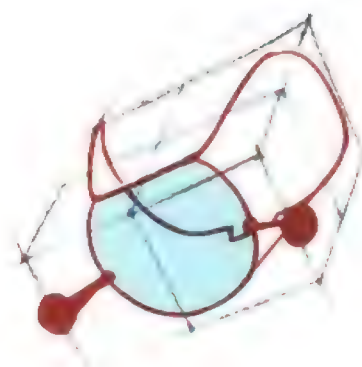
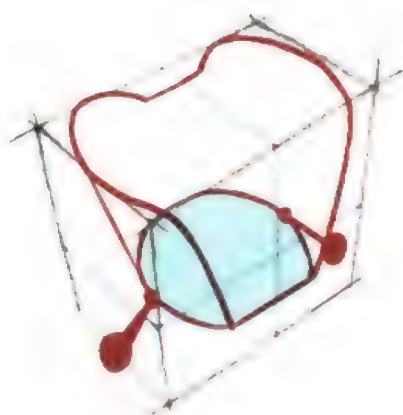
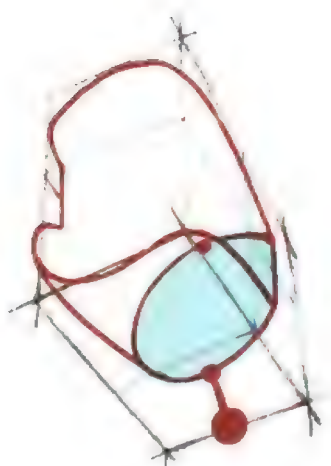
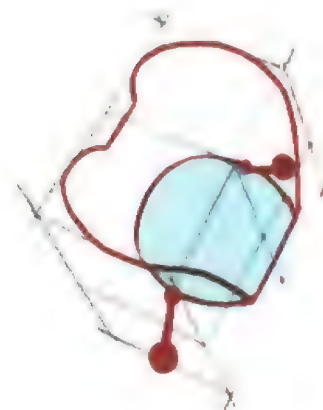
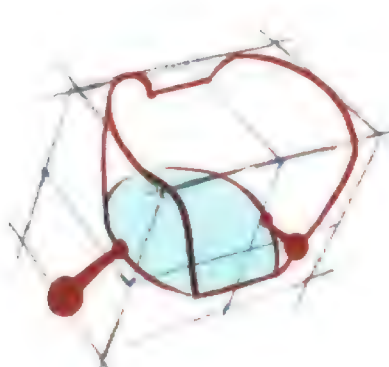
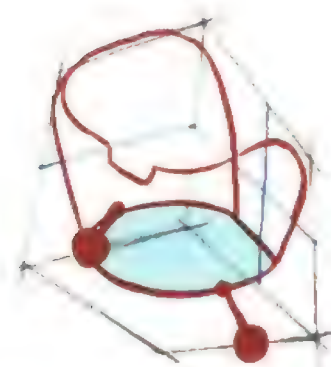


08

The structural relationship between the abdomen and lower limbs



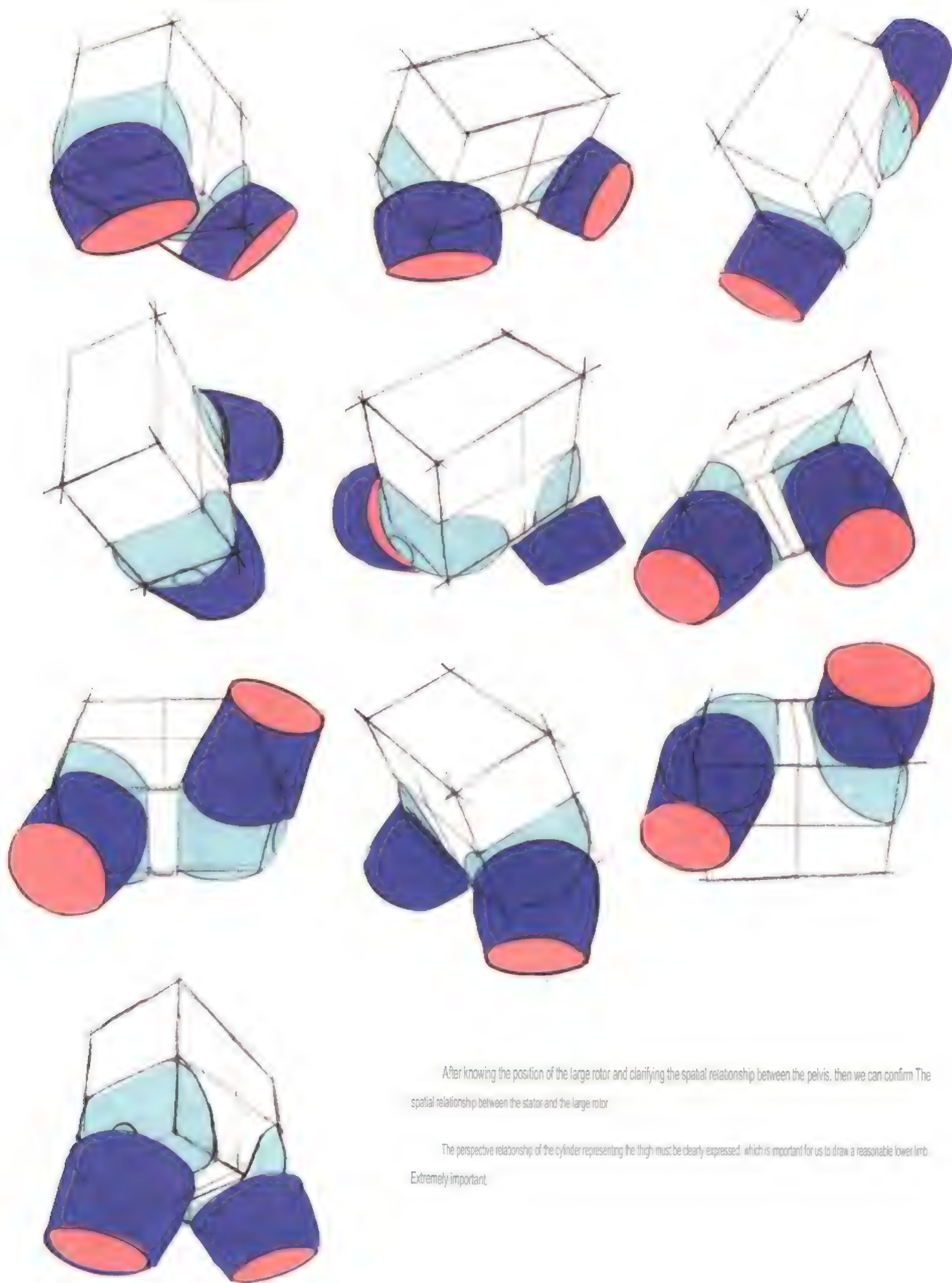
Before drawing the structure of the large rotor, we can first draw squares with different orientations and use two. The sphere fills the square body to represent the position of the root of the thigh, and the large rotor is roughly on the side of the square body. One-half of the bottom sphere



The structure of the pelvis is relatively complex. When the system is given, we can find the location of the pelvis bone on the Fanghe body. However, it is not easy to find the location of the pelvis bone on the Fanghe body. Then draw the bottom of the pelvis on the basis of the pubic bone, and then draw the ups and downs of the pubic bone located at the top of the cube body, and finally Connect all parts together at this time [A basin-like structure].

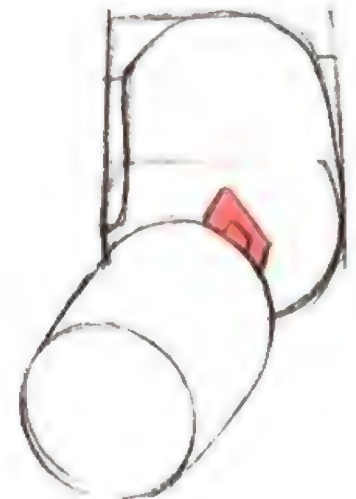
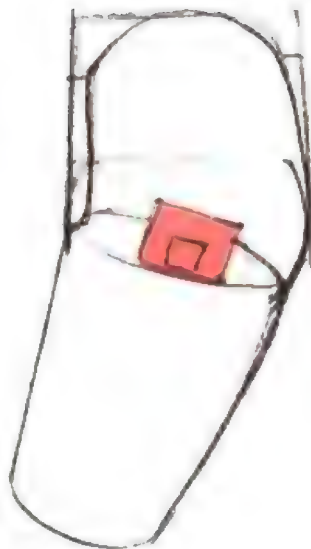
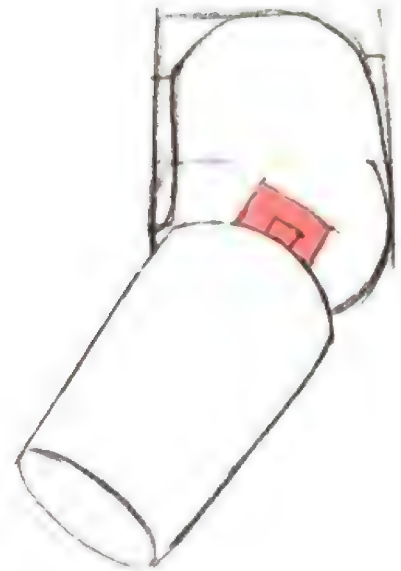
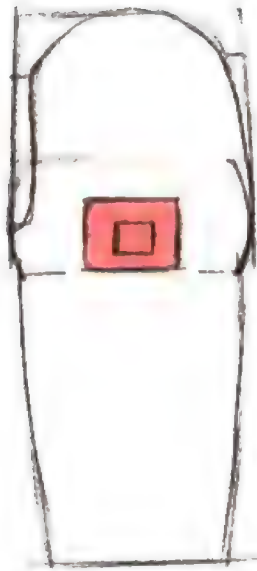
The biggest difficulty in drawing the pelvis is to control the perspective relationship of the entire cube.



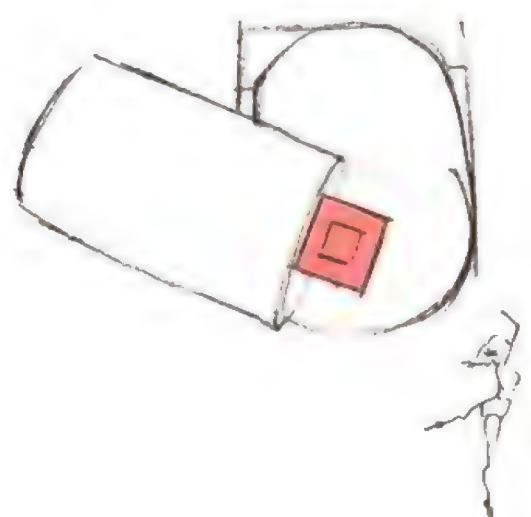


After knowing the position of the large rotor and clarifying the spatial relationship between the pelvis, then we can confirm The spatial relationship between the stator and the large rotor

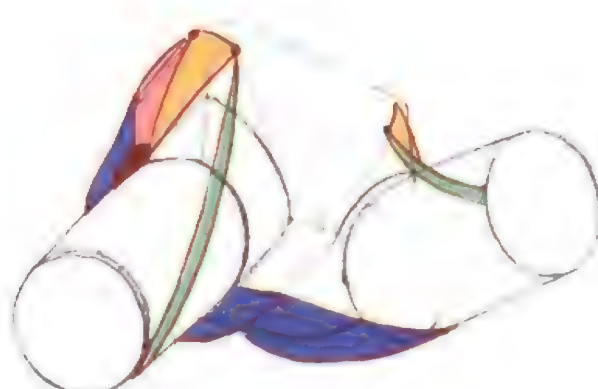
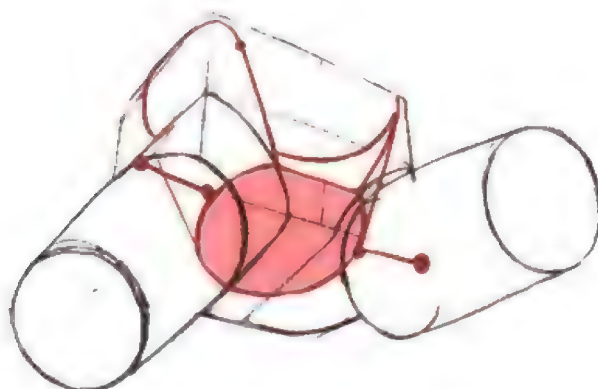
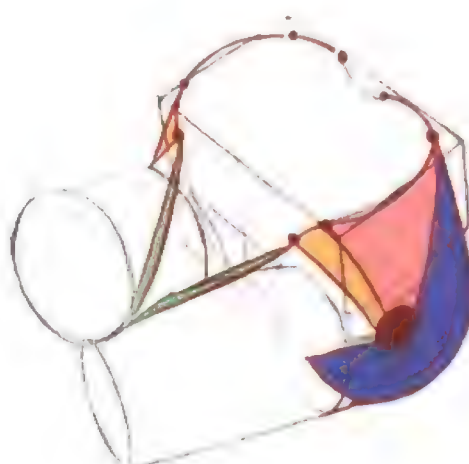
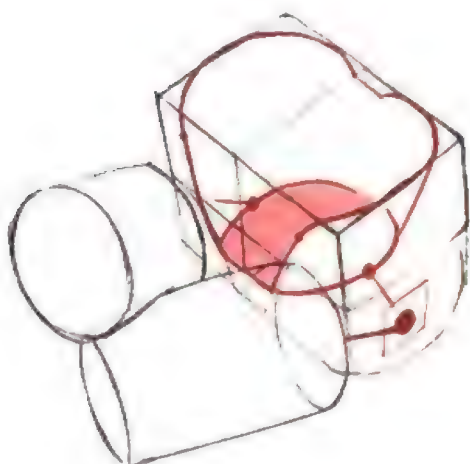
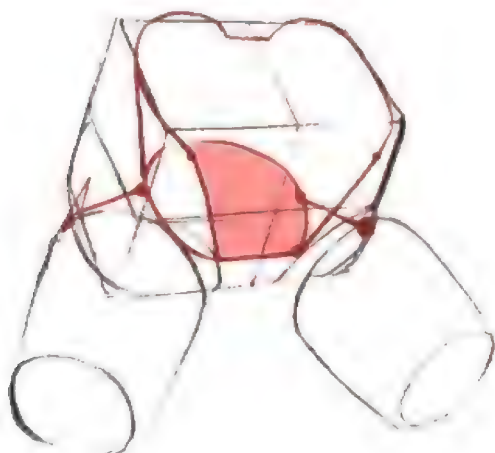
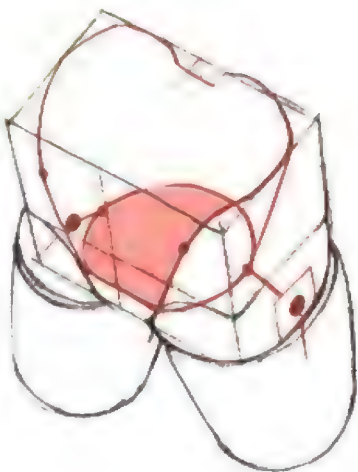
The perspective relationship of the cylinder representing the thigh must be clearly expressed, which is important for us to draw a reasonable lower limb. Extremely important.



When the legs are moving the position of the large rotor is basically not the same. Change, but when it moves its legs in different directions, The turning point on the surface will change. As can be seen from the picture. Out, the square that represents the big rotor will be due to leg movement. If no changes have occurred.

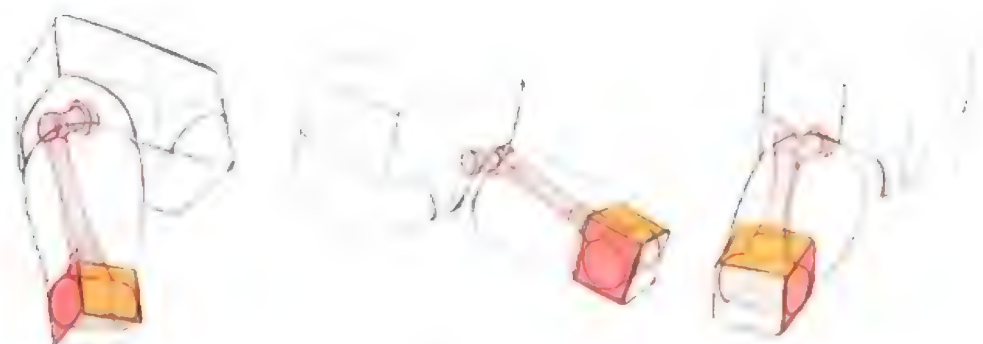


The pelvic structure is heavier. The required muscles are distributed in the pelvis. On the left and right sides, these muscles. The starting point is located at the top of the pelvis, if we will be connected to the big color legs. When the part is in motion, on both sides. The muscles will also be deformed.



09

Structure of thigh muscles



Control the thigh muscles in front of the heel

The steps of the arm muscles are about the same, indeed.

The details of the front, side, and back of the fixed pattern cover

Position, through the square body representing the knee.

Draw the front, inside, and back of the thighs separately

(Facial muscles).

The muscles on the front of the thigh include the femur

Rectus muscle, medial femoral muscle, lateral femoral muscle, etc.

-The three muscles are combined like one.

Flower value

The muscles on the inner thigh are mainly

Semiteless muscle. Comparison of muscle groups on the inner thighs. Complex

it can be collectively referred to as the adductor muscle group

The muscles on the back of the thigh are

mainly Biceps femoris and semitard muscles. It's like a

A small fork is located on the back of the thigh

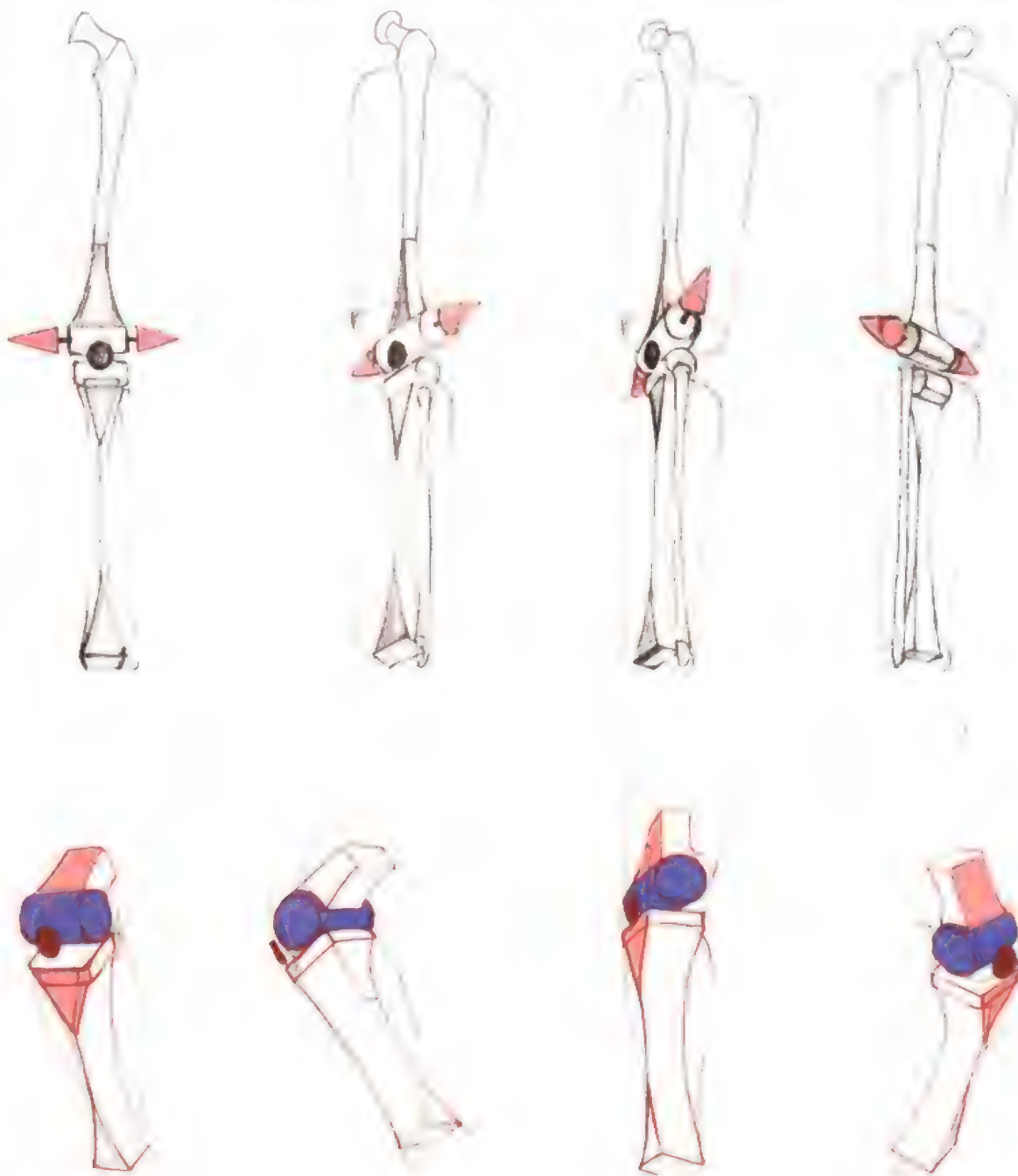


10

Structure of the knee joint

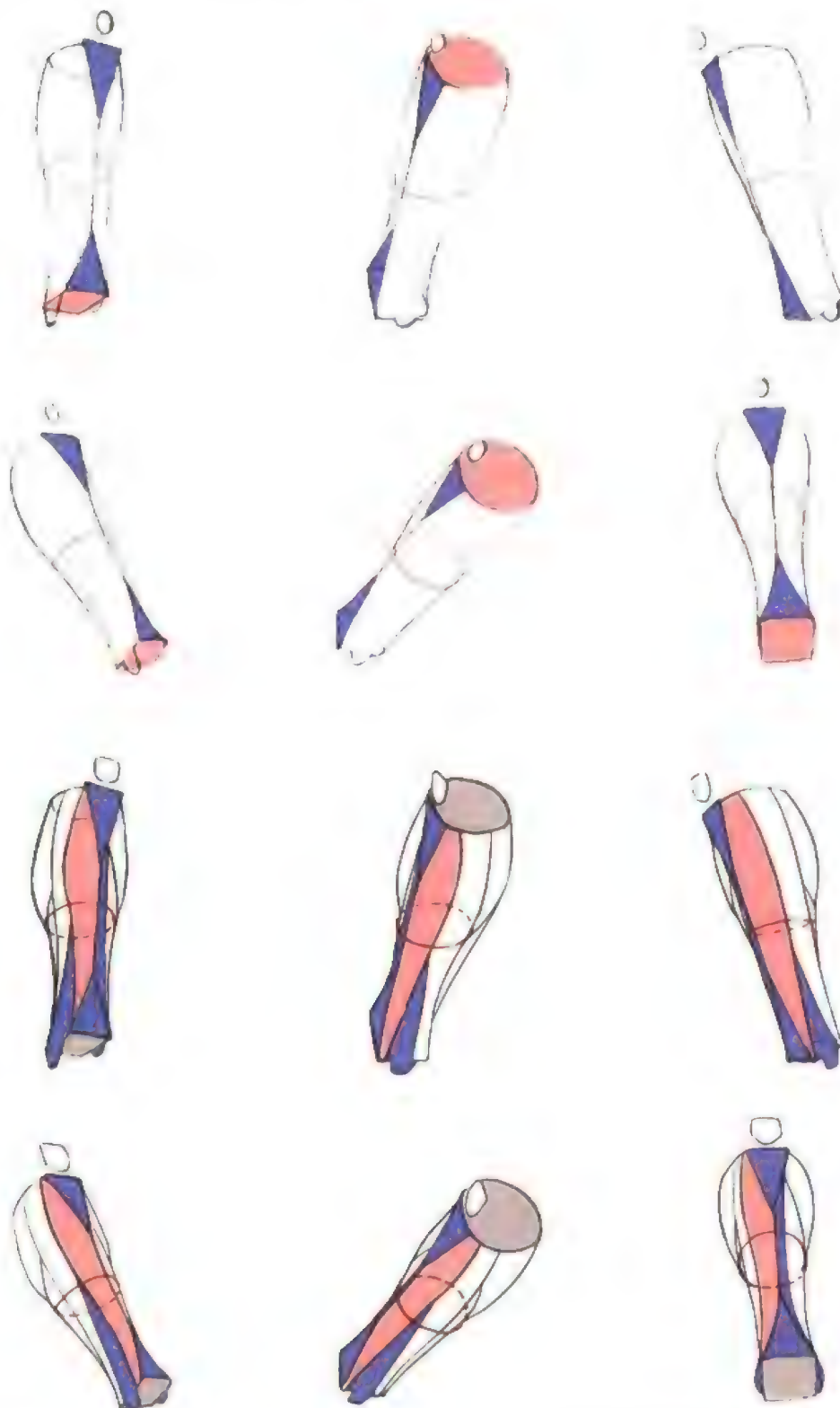
The structure of the knee joint is similar to that of the elbow joint. When we draw it, we can also think of the knee joint as a cylinder.

Joints are an important part of expressing the spatial relationship between the legs, and clearly showing the state of the cylinder at different angles is of great help to subsequent leg shaping.



11

Structure of the calf



You can think of the calf as a cylinder and long. The combination of the cube, at two-thirds of the length of the calf. Divide in one place: the upper part of the calf is like a cylinder, the lower half is like a cuboid.

The muscles on the calf are more troublesome and tend to bones. The anterior muscle is attached to the outside of the foot bone—that is, in the foot Palm the side of the little toe. And the other side is no. The light bones in the muscle packs are exposed.

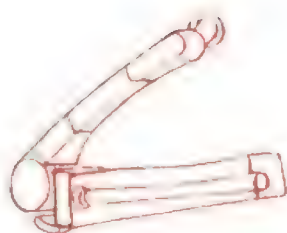


12

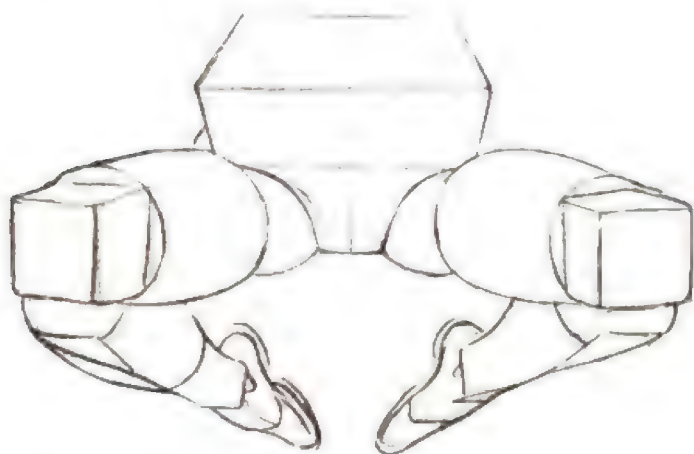
Leg muscle drawing exercises



When drawing leg muscles, we should first put the legs
Think of multiple geometries and control the perspective of several geometries.
Find the coordinate direction of the geometry, and then gradually point
Draw the muscles of the points



◆ Drawing steps of leg muscles



01

Draw the correct perspective of the leg geometry, find the specific position of the pelvis and knees, and characterize its basic form.



02

Draw the muscle groups on the front and inside of the thigh.

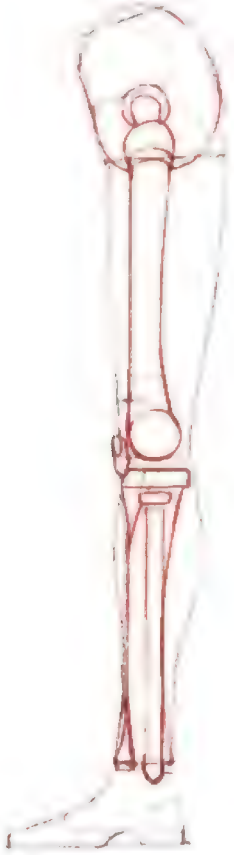
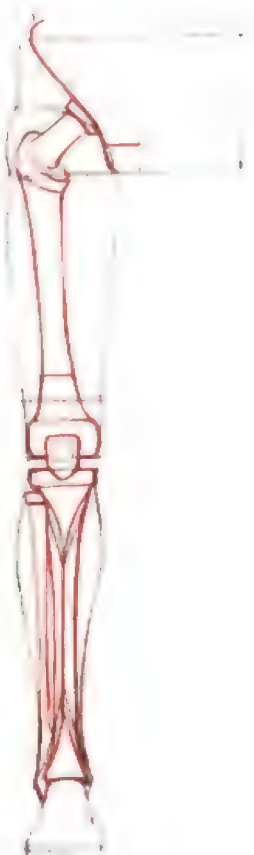


03

Draw the muscle groups on the back of the thigh, and then draw the muscles of the calf, paying attention to the squeeze between the muscles and the muscles.



The drawing steps of the leg muscles and arm muscles are similar. When drawing leg muscles, it is necessary to first express the geometric state of the leg, based on the geometry. Draw the shape of bone cheese at all angles.

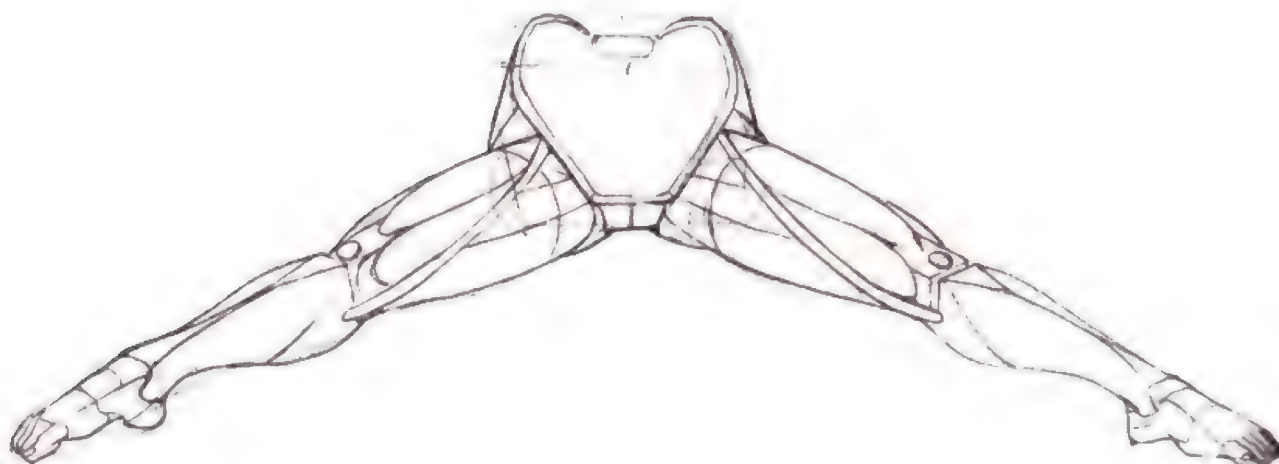


Then the key muscles are given: the *guteus medius* muscle, the *crad. lasso tensor* muscle, the *guteus maximus* muscle, the *seamstress* muscle, the *founder* muscle, and the *cowel* muscle.

Then control the *rectus femoris*, *medial femoris* and *lateral femoris* muscles on the front of the thigh, the *quadriceps femoris* on the back and the *anterior femoral* muscles on the calf.



We can also refer to the leg dynamics of the real human body and practice with reference to the following pictures



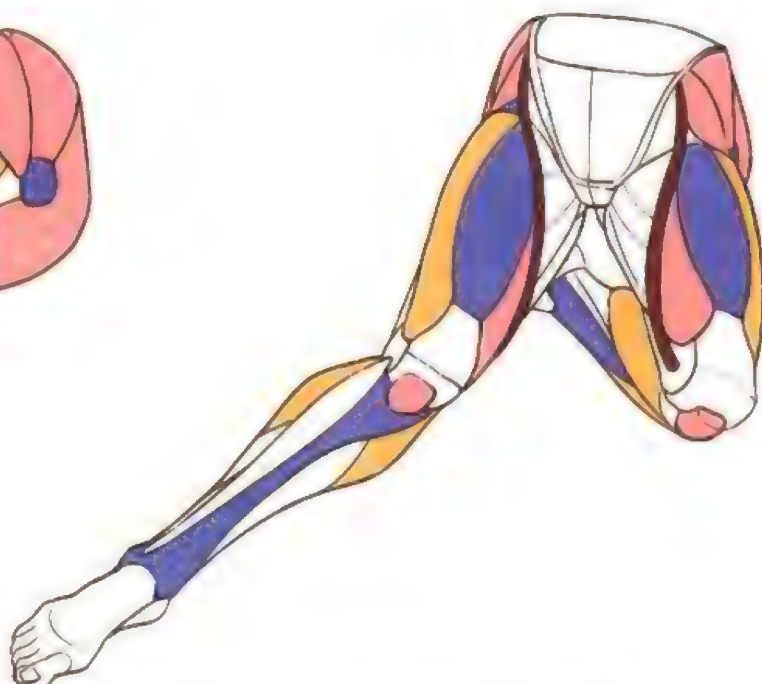
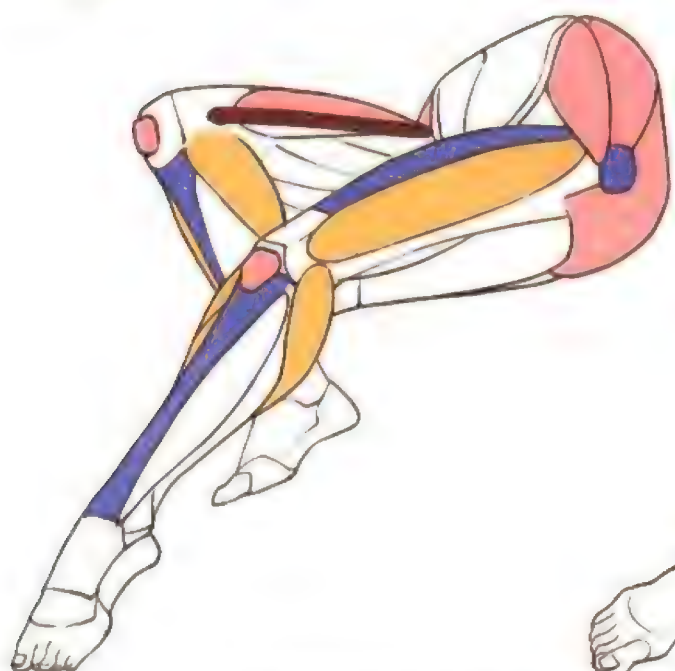
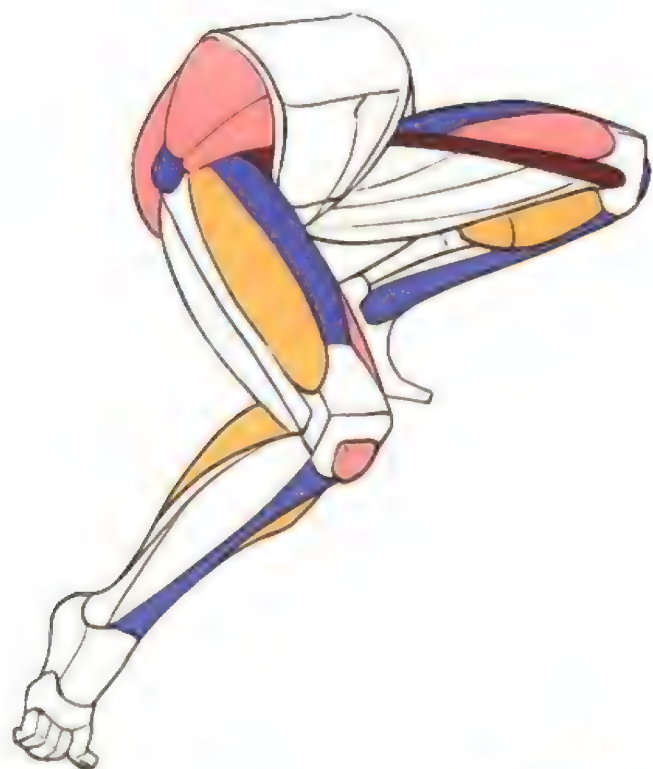
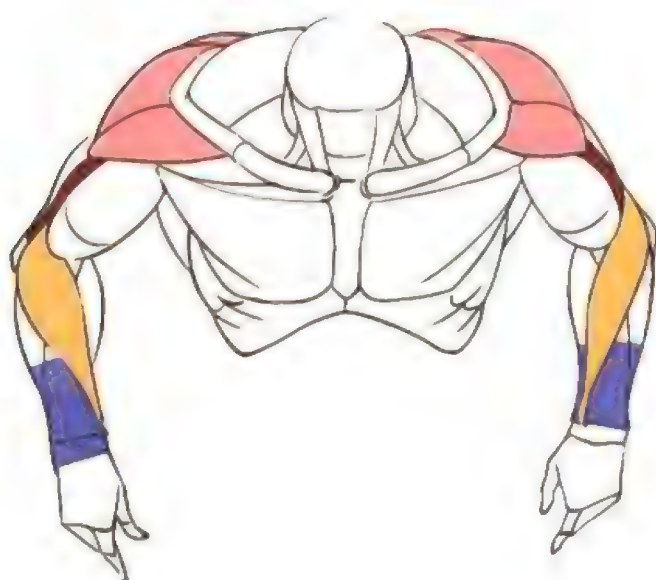
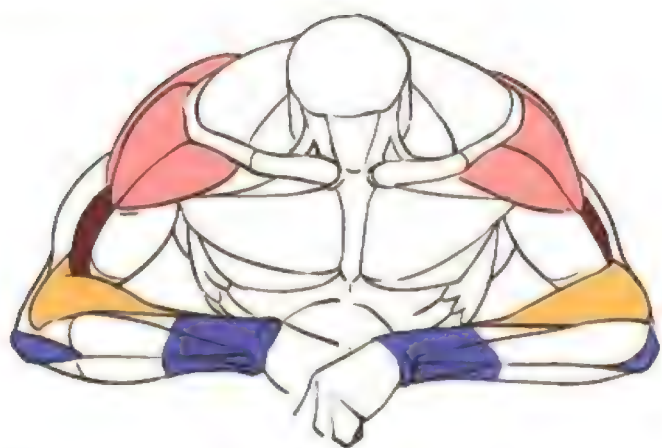
The second block can be seen from the side, but the dynamic pose is simplified. The movement is less clear, but the overall form is more defined. The pose is more dynamic, but the overall form is less clear.



When creating the muscles of the body, it is important to understand the dynamic pose. The dynamic pose is a key element in the design of the body. The dynamic pose is a key element in the design of the body.

Dynamic change





13

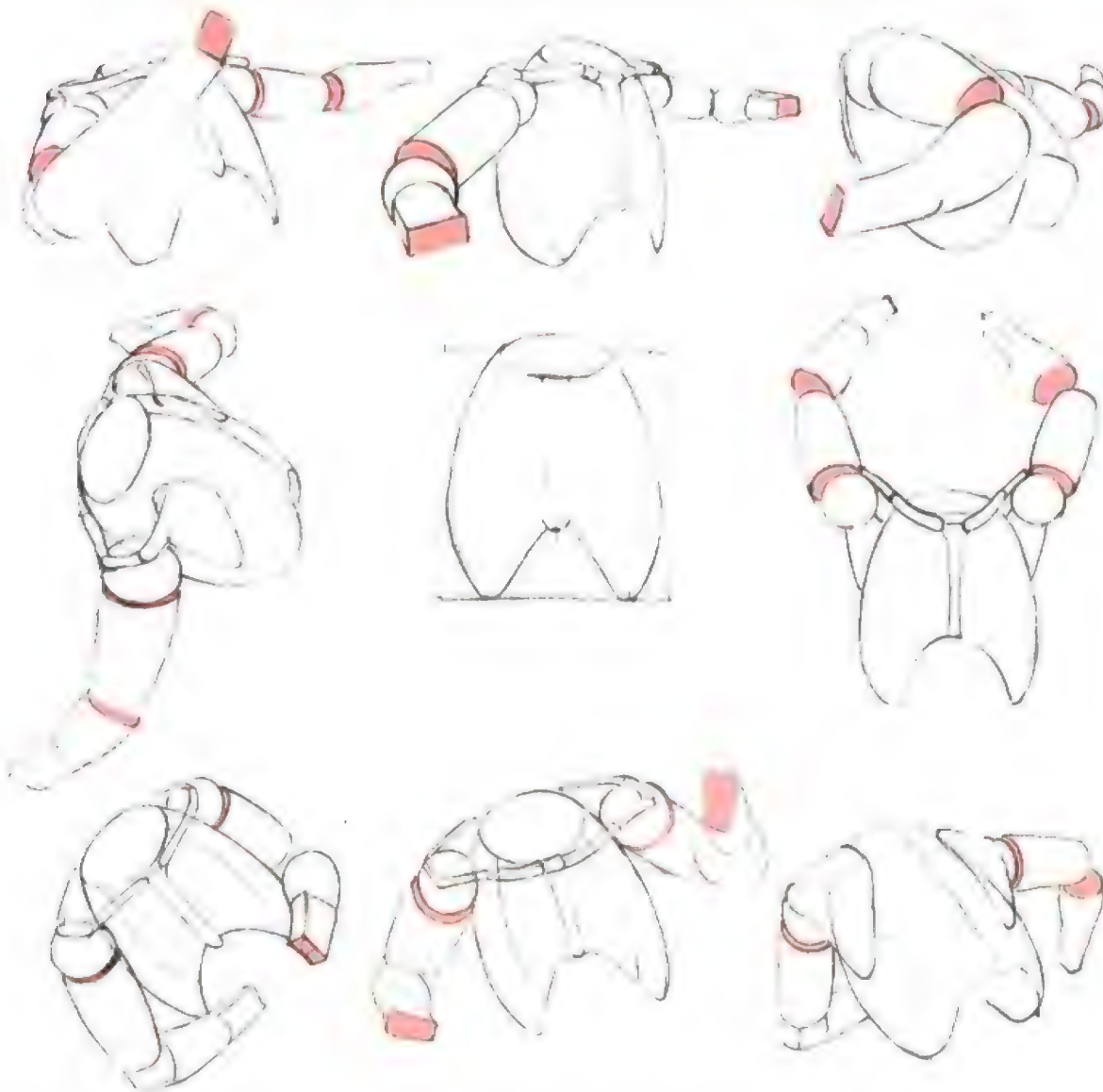
Use of upper limb structure

The effective use of limbs also gives the space performance of the limbs. This spatial performance is based on the changes in the cross-section of the limbs and the changes in the limbs after exercise.

Coordinating information



Draw the cross-section of the limbs rationally, and grasp the scale of the limbs in the space, so that the limbs can be drawn naturally.





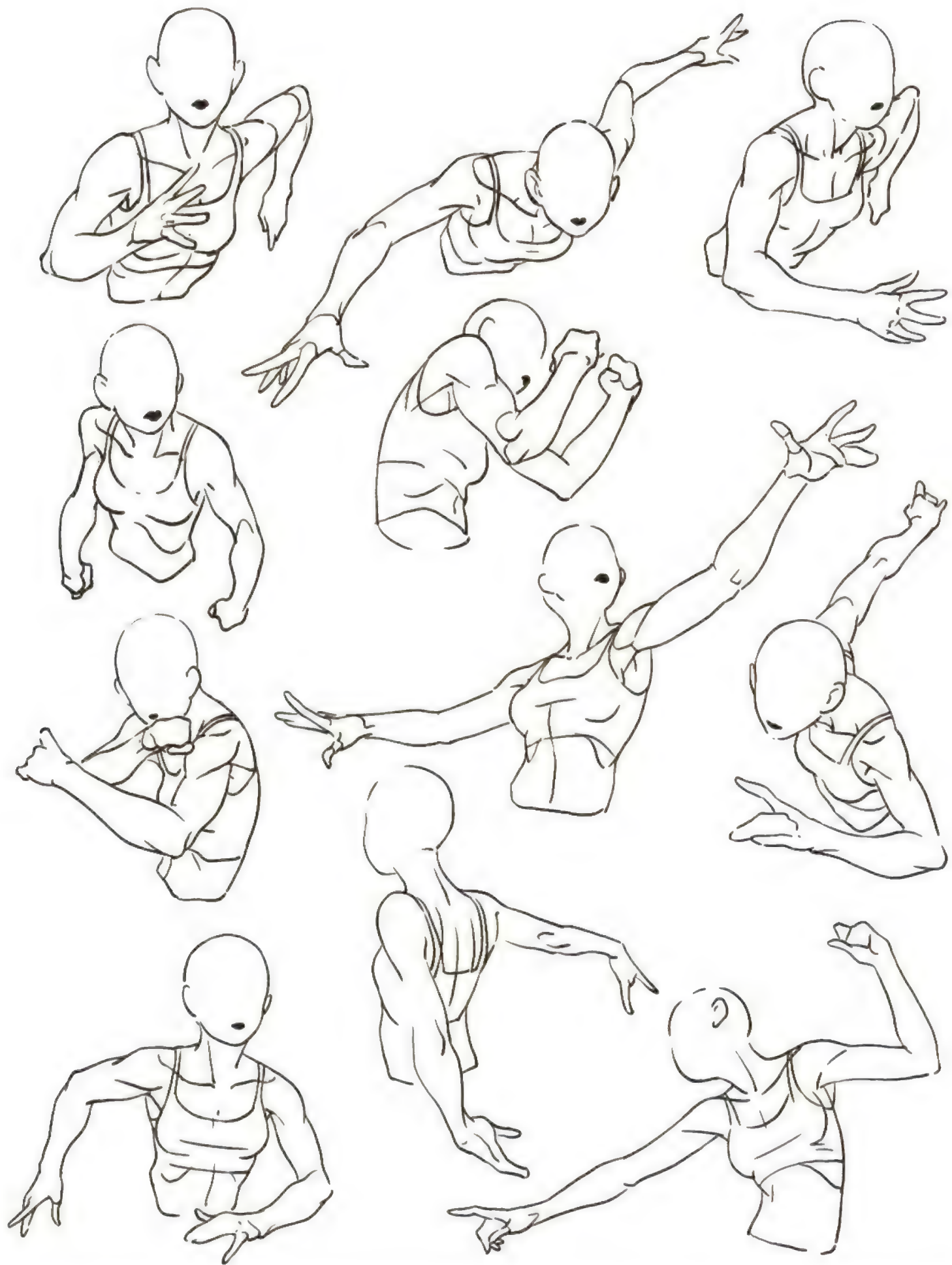
The above sketches are intended to show the upper limbs in various poses, with the red lines indicating the movement of the upper limbs and the red lines indicating the movement of the upper limbs.



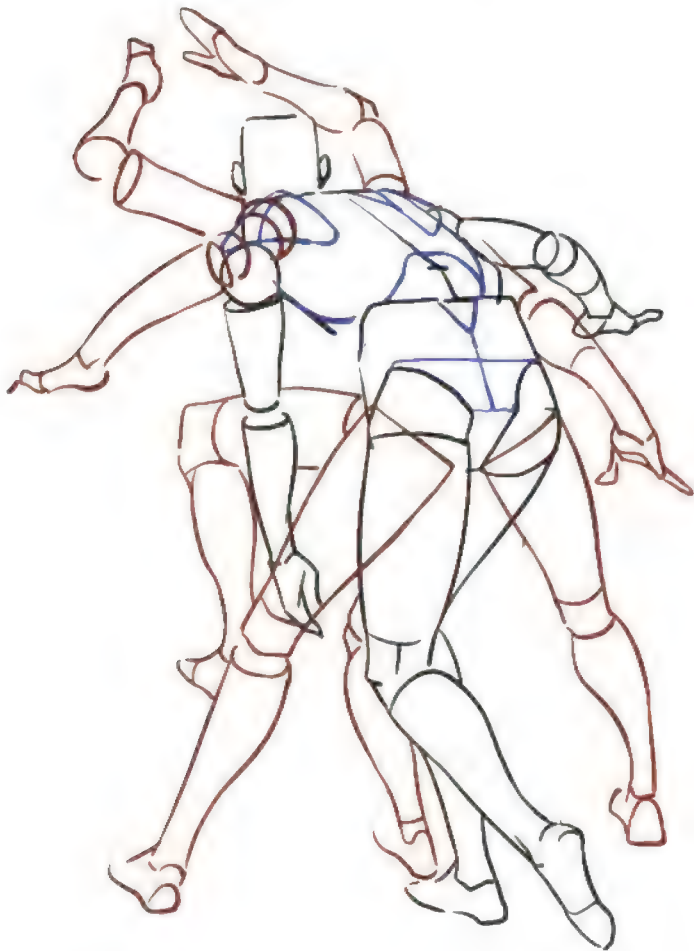
After mastering the relevant knowledge of drawing water limbs, we need to perform a lot of sketching exercises. By drawing the above common reference figures in life, we can draw them more skillfully.

Water Limbs





After understanding a certain knowledge of human body structure, we don't need to draw out every muscle, but should make appropriate trade-offs and practice frequently. Only after reaching a certain amount of practice can we integrate our knowledge of human body structure into our subsequent creations.



After mastering the basic structure of the four limbs, we can try to practice drawing different four-glue combinations on the basis of the same human body stem.





The dynamics of the characters drawn with different combinations of four elbows are not the same, and practising drawing the combination of four limbs is very helpful for us to draw the dynamics of the characters from memories.





After mastering the law of change of the four limbs, we can try to draw such a set of continuous movements, and be familiar with the spatial changes of the four limbs when the movements change.





Chapter Five

Hand and foot structure

第五章

手脚结构

一、手脚的基本结构

二、手脚的比例

三、手脚的透视

四、手脚的素描

五、手脚的色彩

六、手脚的速写

七、抓住东西的手结构练习

八、握拳的手结构练习

九、不同形态的手

十、不同形态的脚

十一、手脚的比例关系

十二、手脚的素描

十三、手脚的色彩

十四、手脚的速写

十五、手脚的透视

十六、手脚的基本结构

十七、手脚的比例

十八、手脚的透视

十九、手脚的素描

二十、手脚的色彩

二十一、手脚的速写

二十二、手脚的透视

二十三、手脚的基本结构

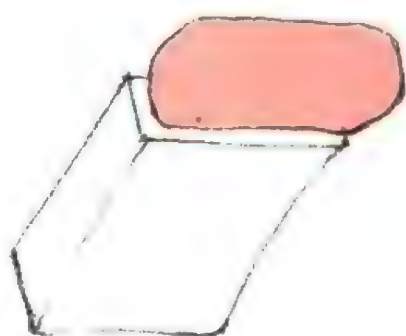
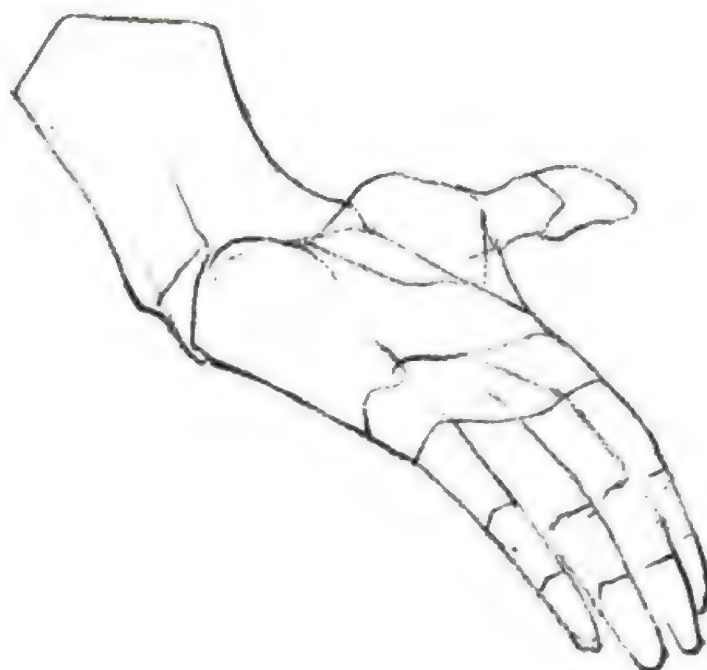
二十四、手脚的比例

二十五、手脚的透视

01

Dismantling of the structure of the hand

The hand is a more complex part of the human body, and there are multiple hands on it. Joints, the turning of each joint will cause the fingers to produce corresponding. The perspective changes. When the hand is active, the form of the fingers appears. It is very rich.



wrist



finger



Palm

In order to facilitate mastering the structure of the hand, we can be the knot of the hand. The structure is simply split into three parts: wrist, palm, and finger.

If you want to combine these three parts effectively, you need me. We have mastered the key structural principles of each part.

02

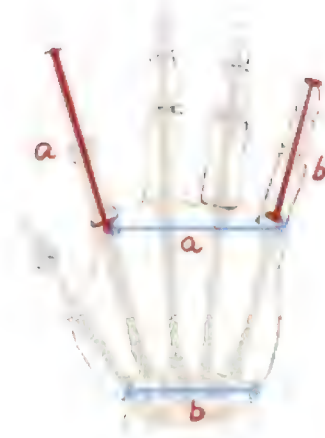
Hand ratio



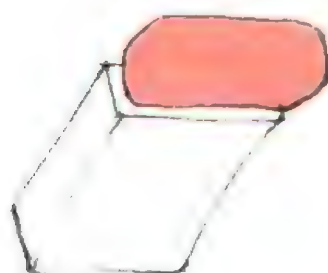
The fingers are divided into upper and lower parts, the upper part The length is the same as the length of the palm hidden in the palm.



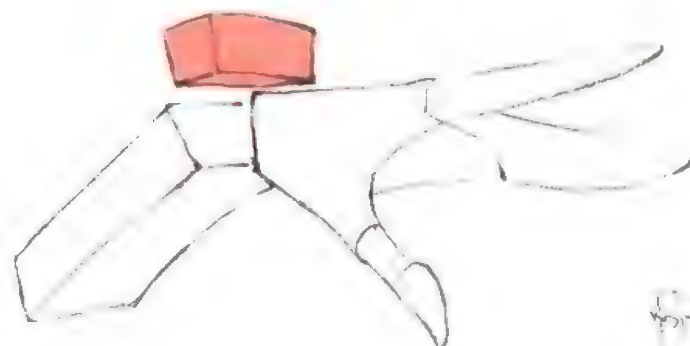
Divide the palm into two parts, the upper part is the upper part, the lower part is the lower part, the length of the palm is equal to the length of the wrist and the palm.



The length of the palm is equal to the length of the wrist and the palm. The length of the palm is equal to the length of the wrist and the palm.



The wrist is composed of eight small bones, and we can simplify it into a soft square body embedded in the wrist.

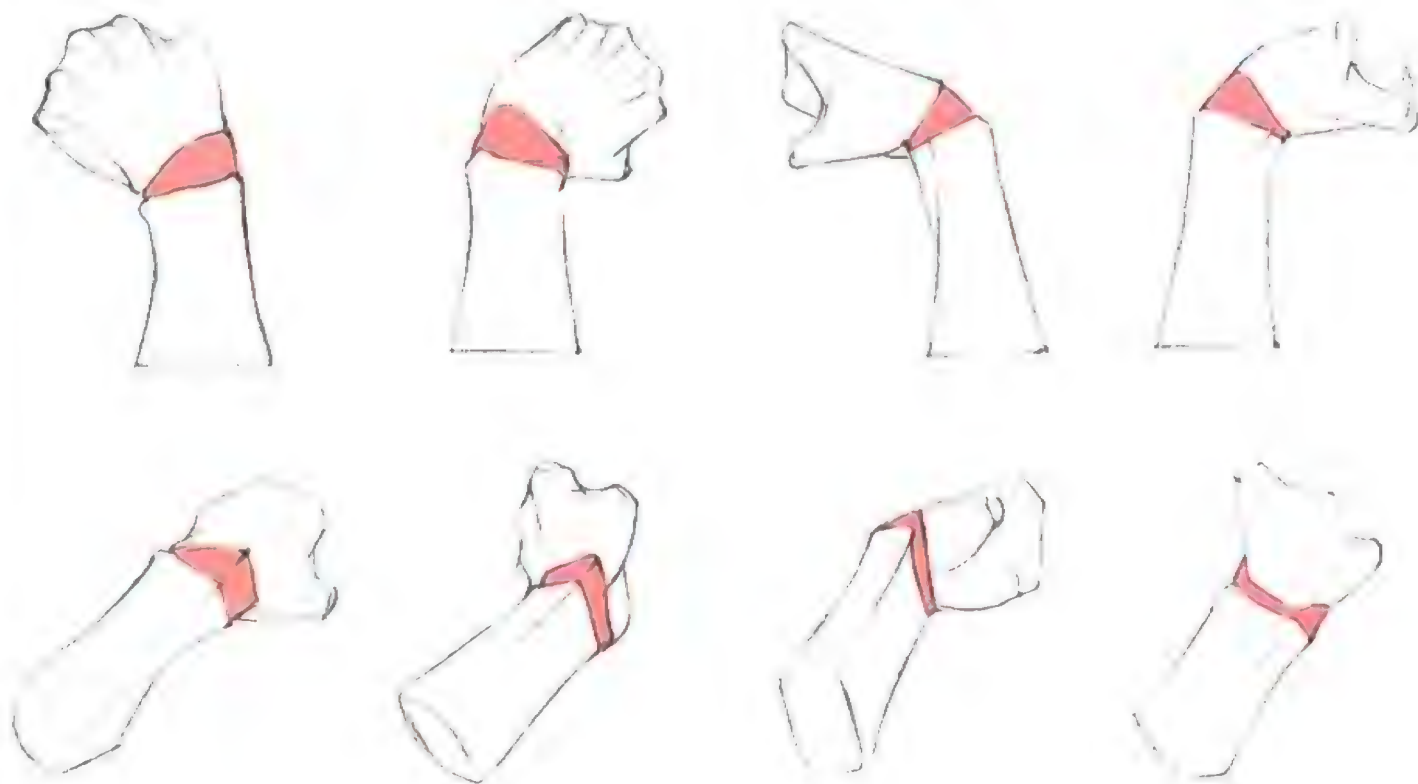


03

Wrist structure

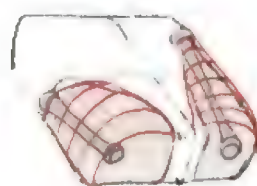
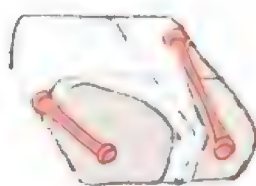
When the hand moves at different angles, the square body of the wrist will also produce corresponding squeezing and pulling

When making wrists, it is extremely important to show the three-dimensional sense.

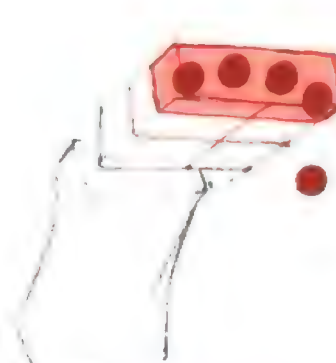
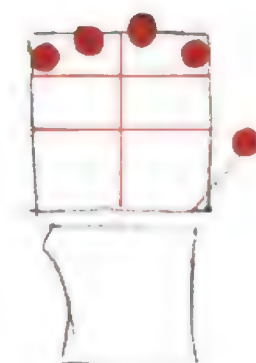
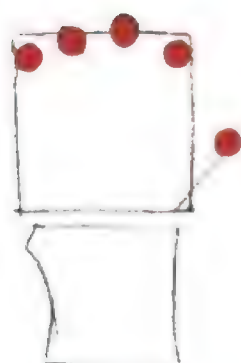


04

Structure of the palm



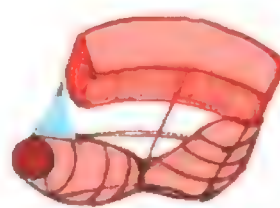
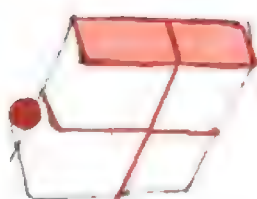
We can simply put our palms Understand
it as a square body, and then use ten. Divide the
word line and find the big reveal finger separately
And the two muscles on the teenager's finger, this
The two muscles will be produced with the movement of the hand
There are certain ups and downs



The roots of the fingers are hidden in the
palm Among them, their position is high and
low Scattered Want to draw your fingers well, I
We can first familiarize ourselves with the roots of
the fingers in each The position at an angle.



We put the two muscles on the palm of our hand
Connect the meat to the roots of the fingers, and then
Identify the location of the tiger's mouth, then you
have to The structure of the palm will be very clear



One palm is not completely still, When
the hand is doing specific movements, learn
The surface will bend, and after bending, the big finger and
The muscles on the small and/or fingers will also be produced
Raw squeeze.



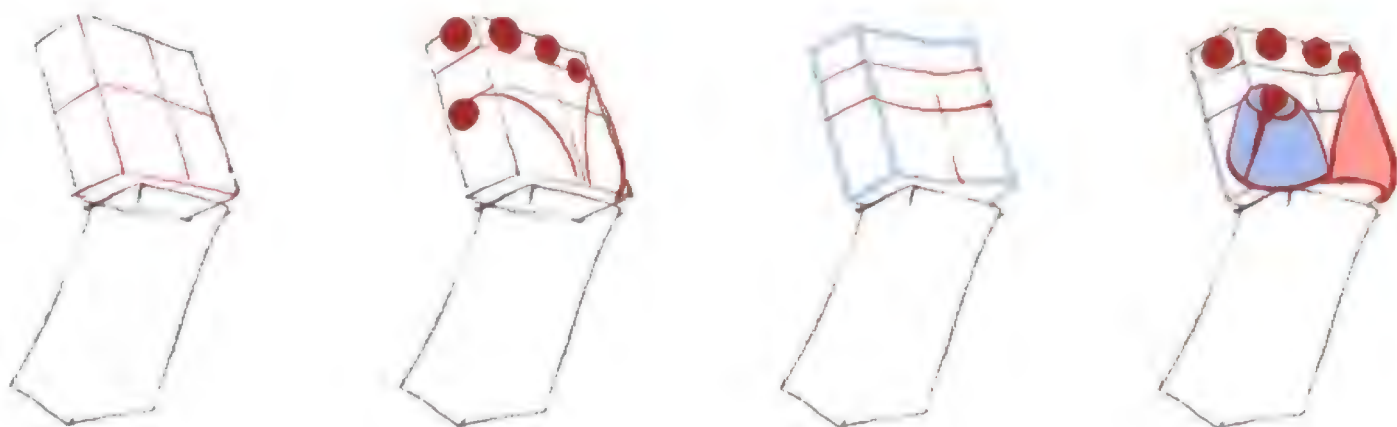


In order to better grasp the structure of the palm, we can simplify the processing of the palm through the above steps.

In the process of understanding the structure of the palm, we need to understand the position of the palm. The palm is the central part of the hand, and it is the base of the fingers and thumb. The palm is the part of the hand that is the most active and the most sensitive. The perspective relationship of the wrist.



In the process of understanding the structure of the palm, we need to understand the position of the wrist. The wrist is the joint between the forearm and the hand. The wrist is the part of the hand that is the most active and the most sensitive. The shape of a palm surface will change accordingly. When the aunt's finger and the little mother's finger are active, the related muscles will also move with it.



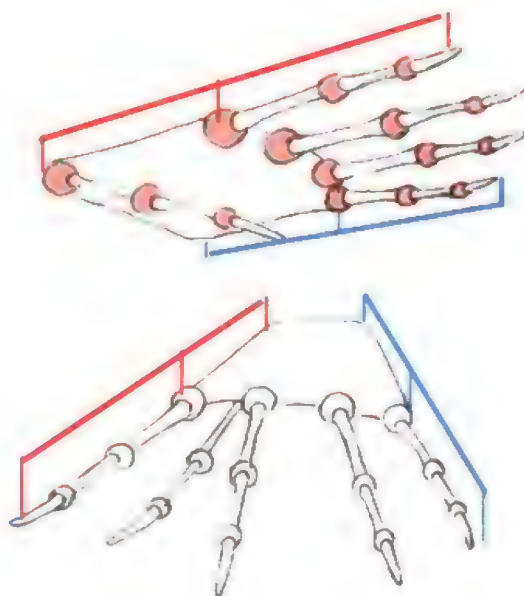
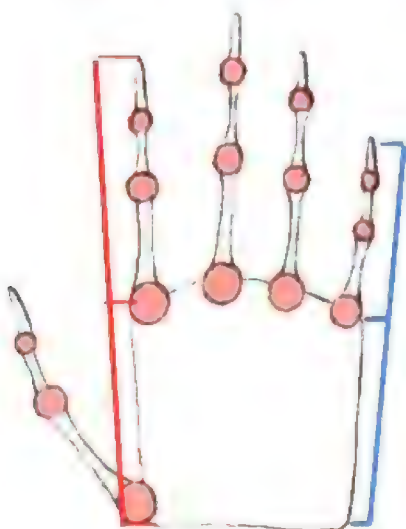
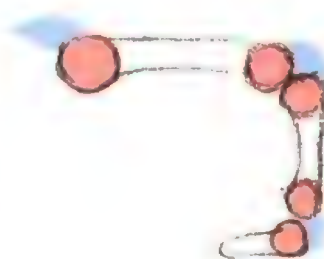
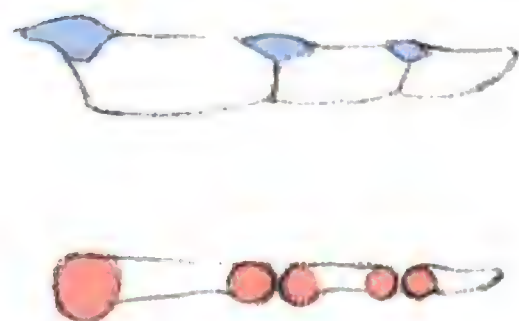
In order to facilitate understanding of the movement state of the palm, we can think of the palm as a square body. When the square body changes due to activity, its internal muscles and bones will be affected. The range of movement of the palm is very limited. Master the simple movement and orange laws of the palm. Only when you add fingers and wrists in the future can the state of the entire hand be better accurate.

05

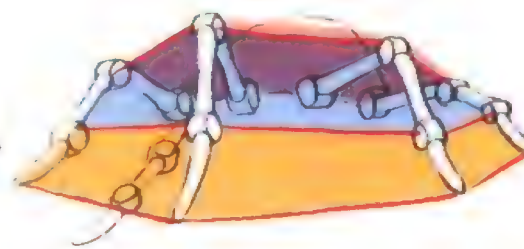
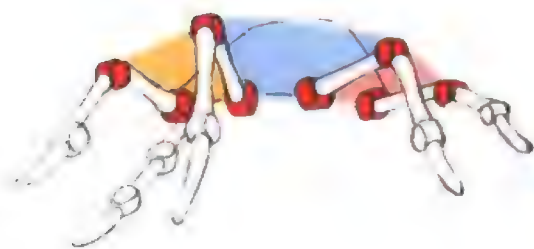
Structure of the finger

Portraying the fingers is the most difficult part of drawing the entire hand. Before portraying, we can first understand the structure of the fingers.

Except for the big finger, the length of the first phalanx of the remaining fingers is equal to the total length of the other two phalanges. When the finger is bent, we must control this length relationship.



To portray the fingers, you need to let the fingers and hands. The palm looks harmonious, which requires us to be strict. The grid controls the length of the finger so that it is transparent. Depending on the changes and the bone coins hidden in the palm, the length is the same.

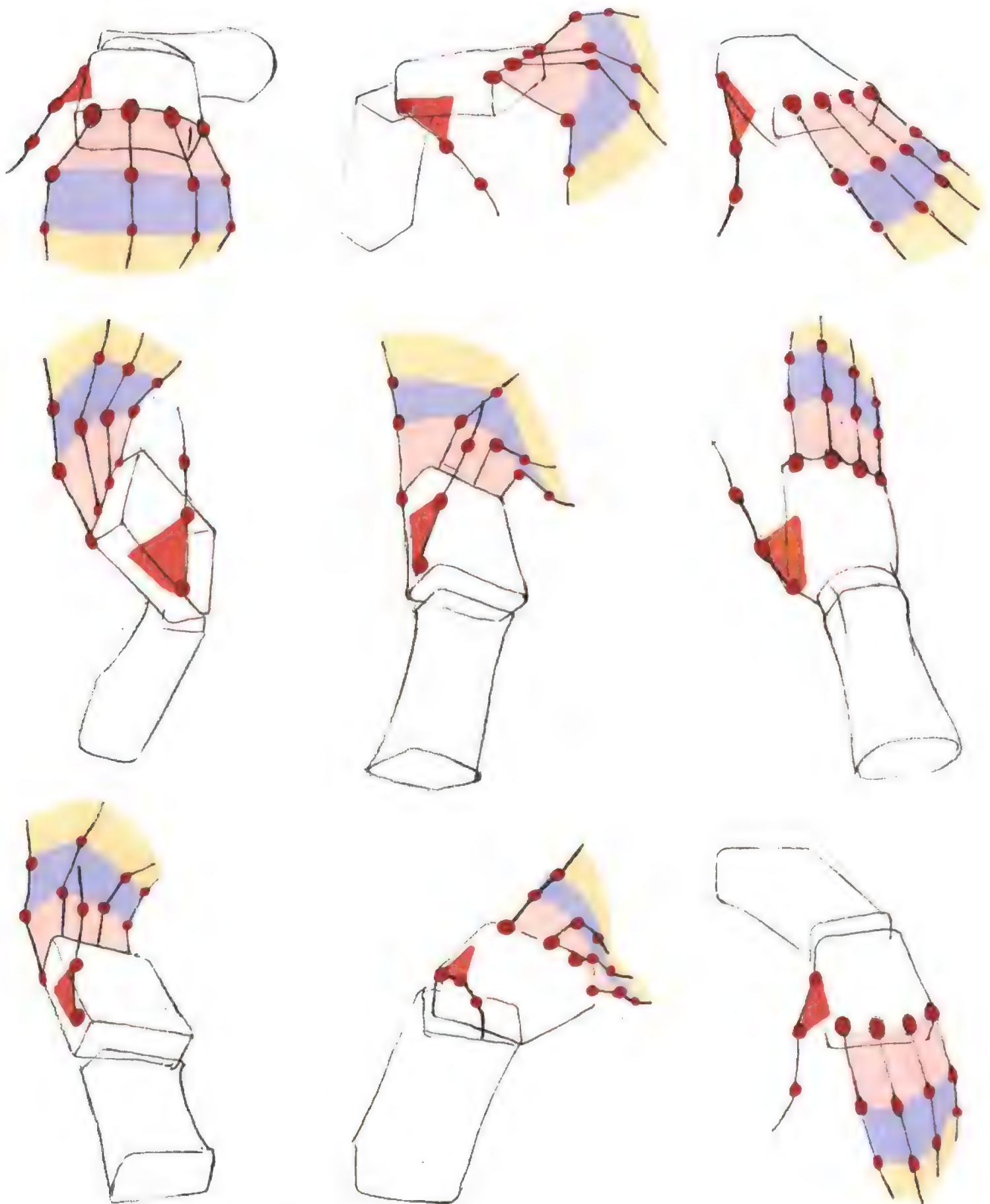


When we make fingers, we can

To observe more about the production of finger parts connected to each other. The fan-shaped relationship of life, draw the fan-shaped relationship. If the system is in place, you can better express your hands.

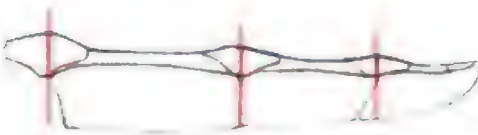
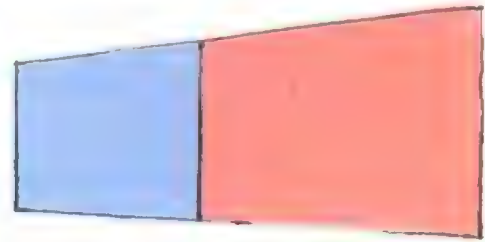
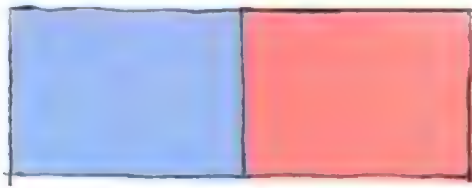
Refers to the proportional relationship after exercise.



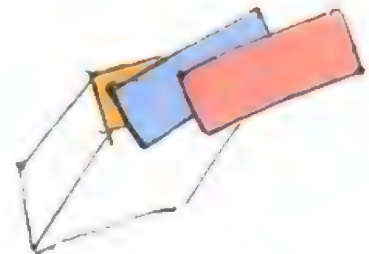
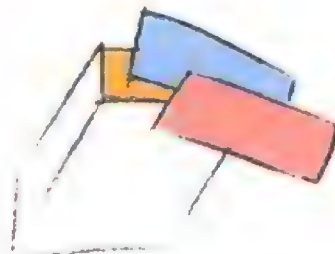
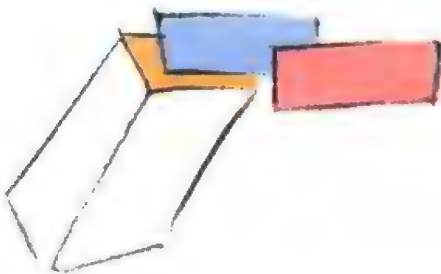


The above is the exercise of drawing the fan-shaped relationship between the joint points of the fingers. This exercise can help you better control the proportional relationship of the entire hand.

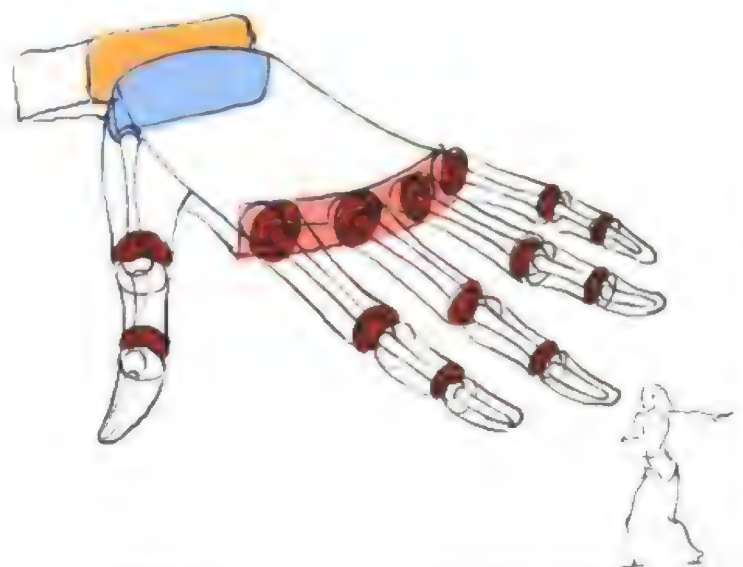
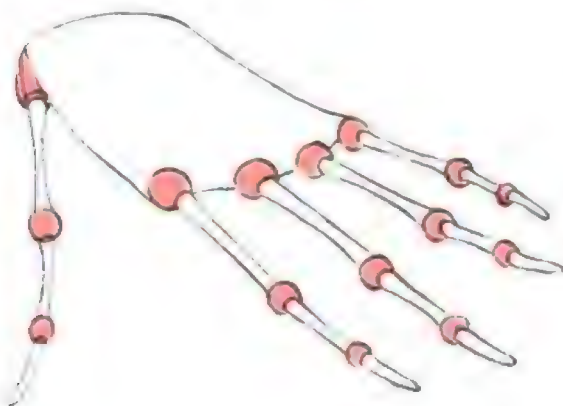
We can simply understand the perspective relationship of the fingers in this way: the length of the red area and the blue area is the same. When a certain perspective change occurs, the red area and the blue area will be corresponding changes in the length.



The finger will have an extra cross-section in the perspective state, and the shape of the cross-section in different positions is different.

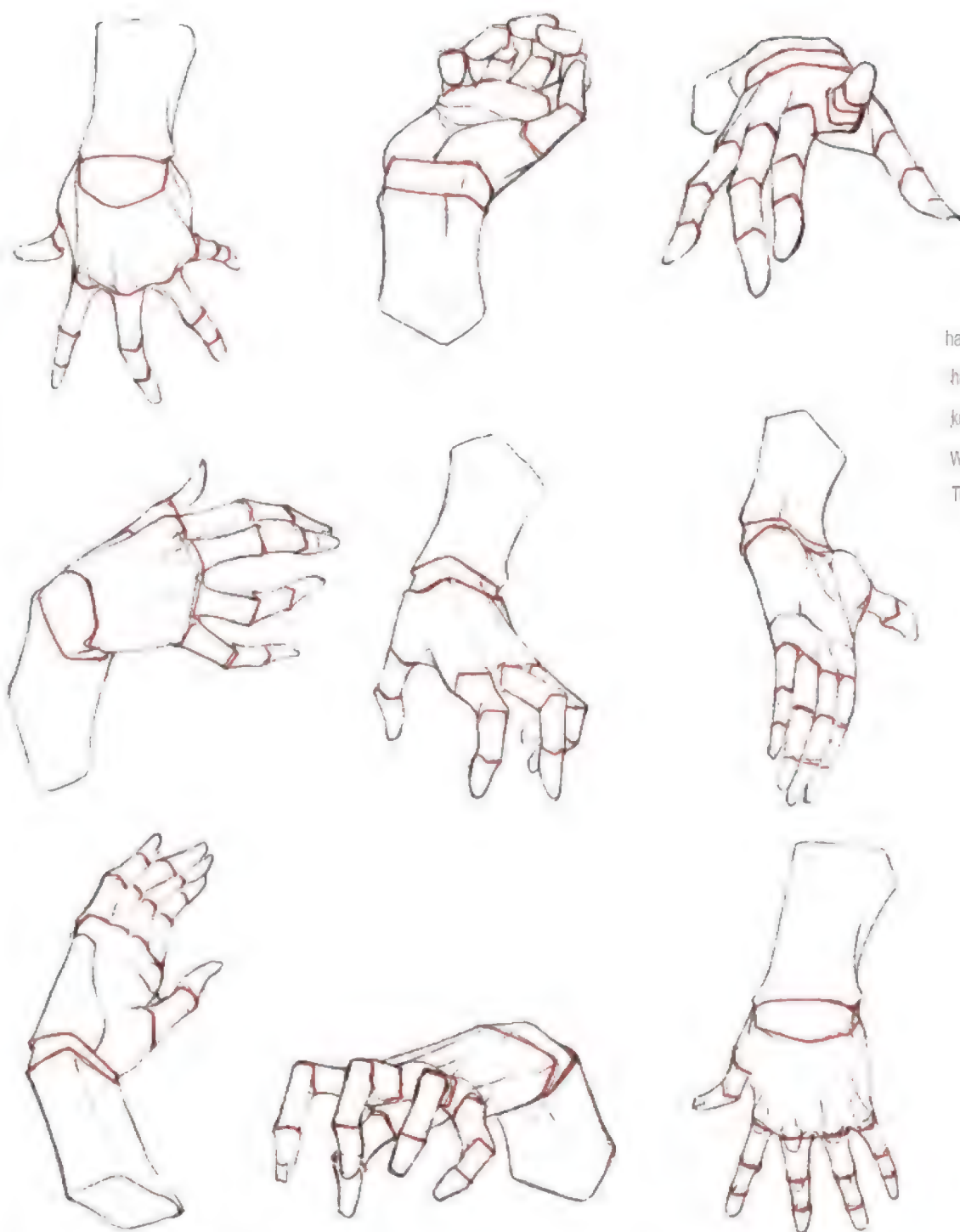


By understanding the perspective relationship of the fingers in this way, we can understand the perspective relationship of the hand and foot. When a certain perspective change occurs, the red area and the blue area will be corresponding changes in the length. The performance is clear, which will play a great role in the subsequent performance of the perspective of the finger.



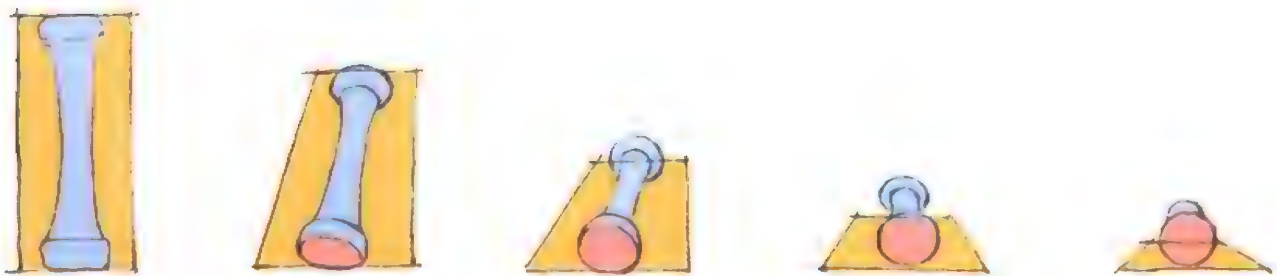
06

/Spatial relationship of hands

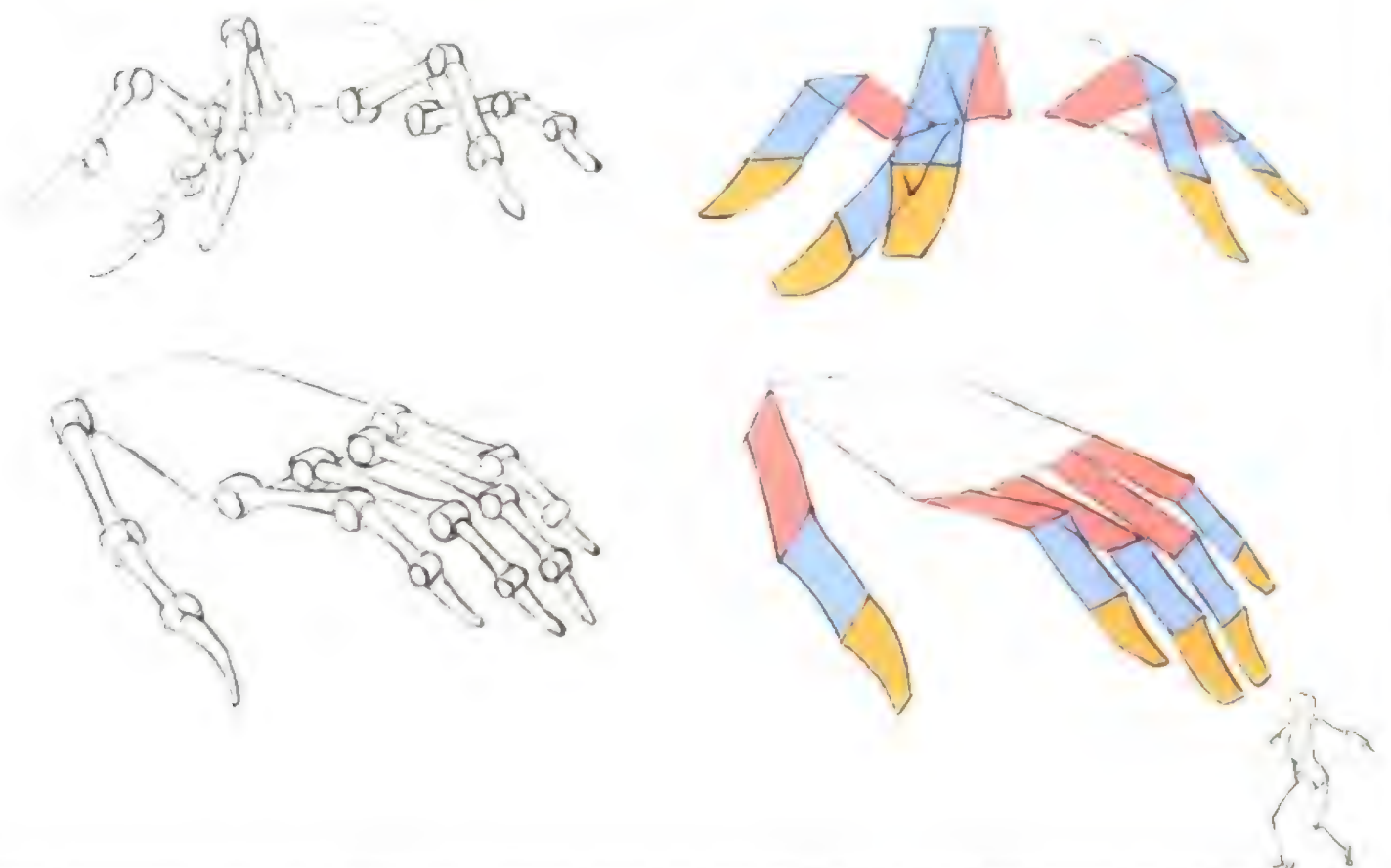


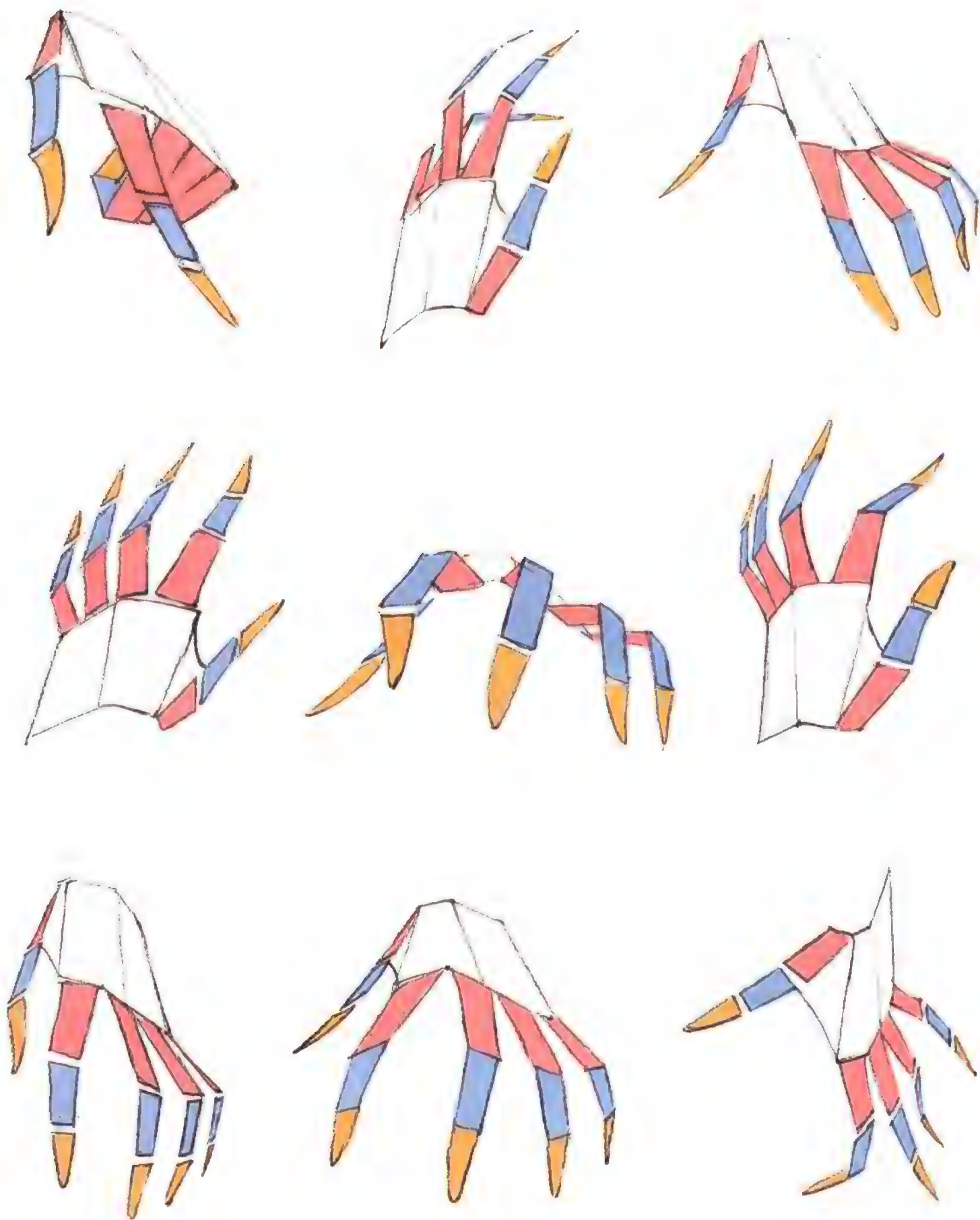
Practicing giving a single
hand When we can treat each
hand Cross-sectional perspective of
knuckle points Identify, this can help
We consciously control our fingers
The length relationship in space.

The perspective of the fingers will affect the overall performance of the hand. If we only think of the finger as a cylinder, the cylinder will break when the finger turns. So here we are. Combine the cylinder and the face, and simply process the perspective of the cylinder generated by the changes when they are active into a perspective of the surface.

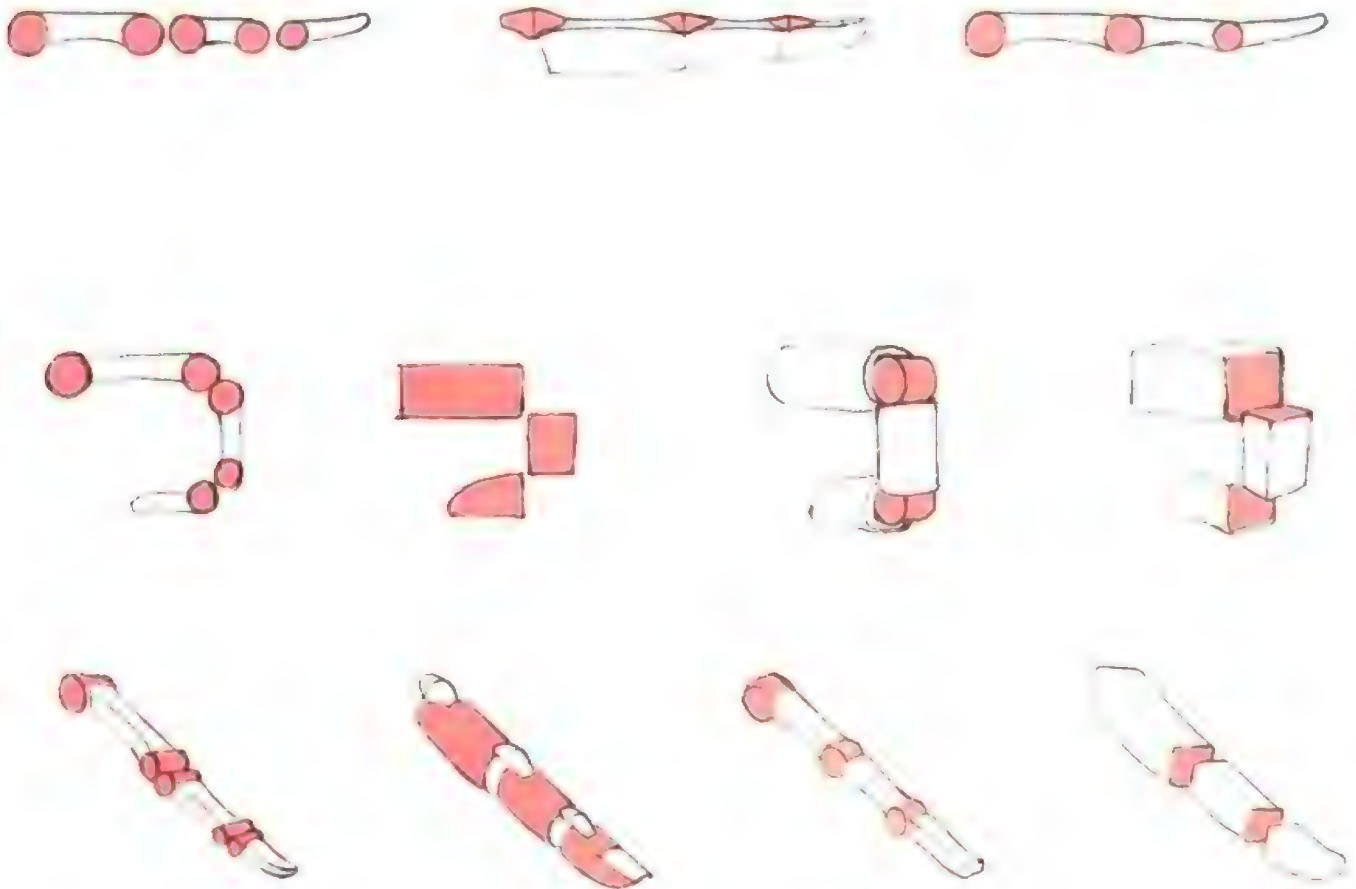


When we transform the local stereo perspective of the knuckle joints into the overall surface perspective, we can grasp the spatial relationship of the hand faster.





The flake treatment of the handle can allow us to better feel the transition relationship of the hands in each perspective state. After we control this transition relationship, we can apply it to the perspective changes of the real hands.

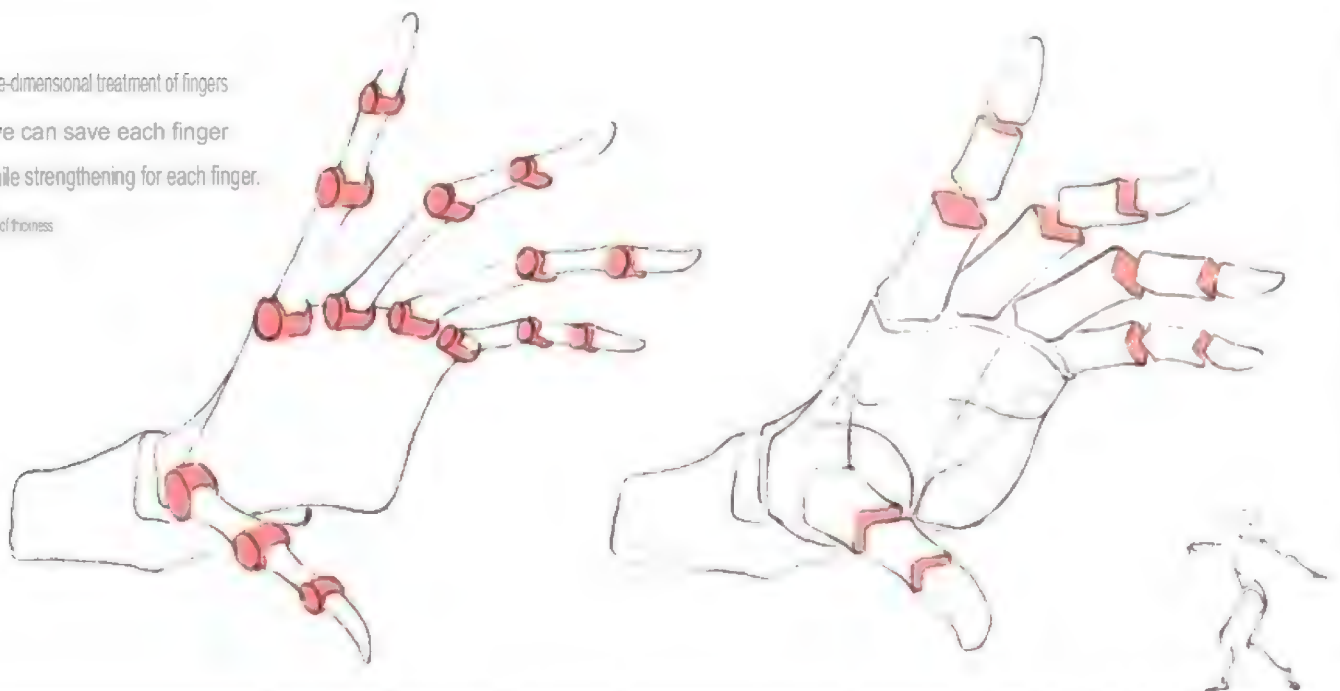


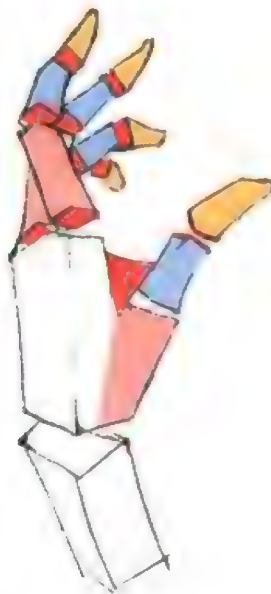
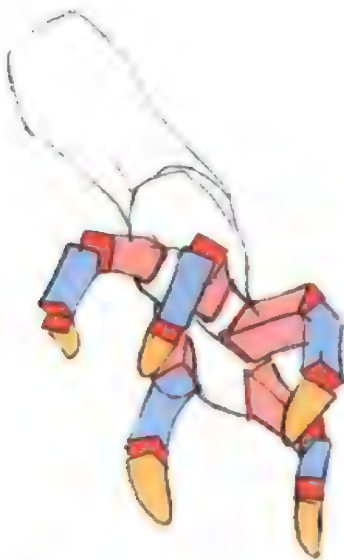
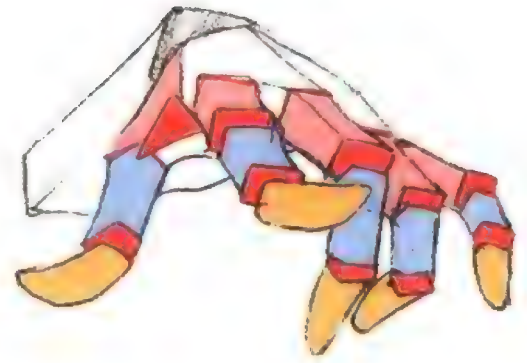
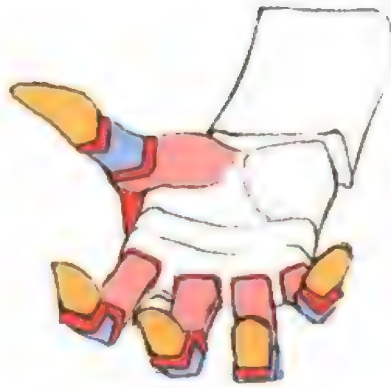
In order to better shape the hand, we can also perform three-dimensional processing of the fingers, which also helps us control the perspective of the details of the fingers.

Three-dimensional treatment of fingers

When we can save each finger
Joints, while strengthening for each finger.

The performance of thickness





When drawing each finger, we must understand the axis of finger changes, consider the orientation of the cube body representing the joint point and the corresponding space relationship.

07

Hand-drawing exercises for grasping things

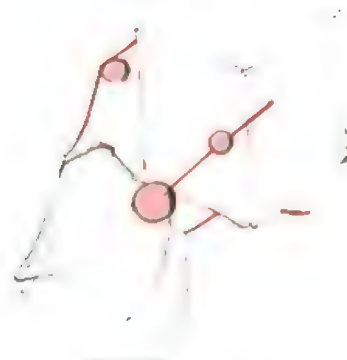
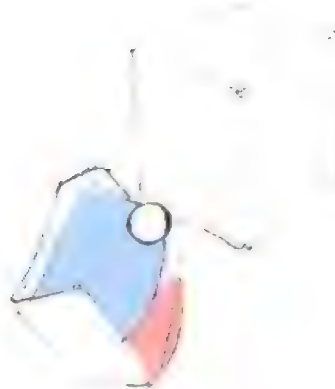
◆ Drawing steps of the hand holding the object



01

Determine the volume of the painted object, and then draw the one representing the palm of your hand.

Cube body (note that the perspective of the cube body should be correct).



02

Add two muscles on the big finger and the small finger to the square body.

Inside, find the root of the finger and mark the finger and finger joints.

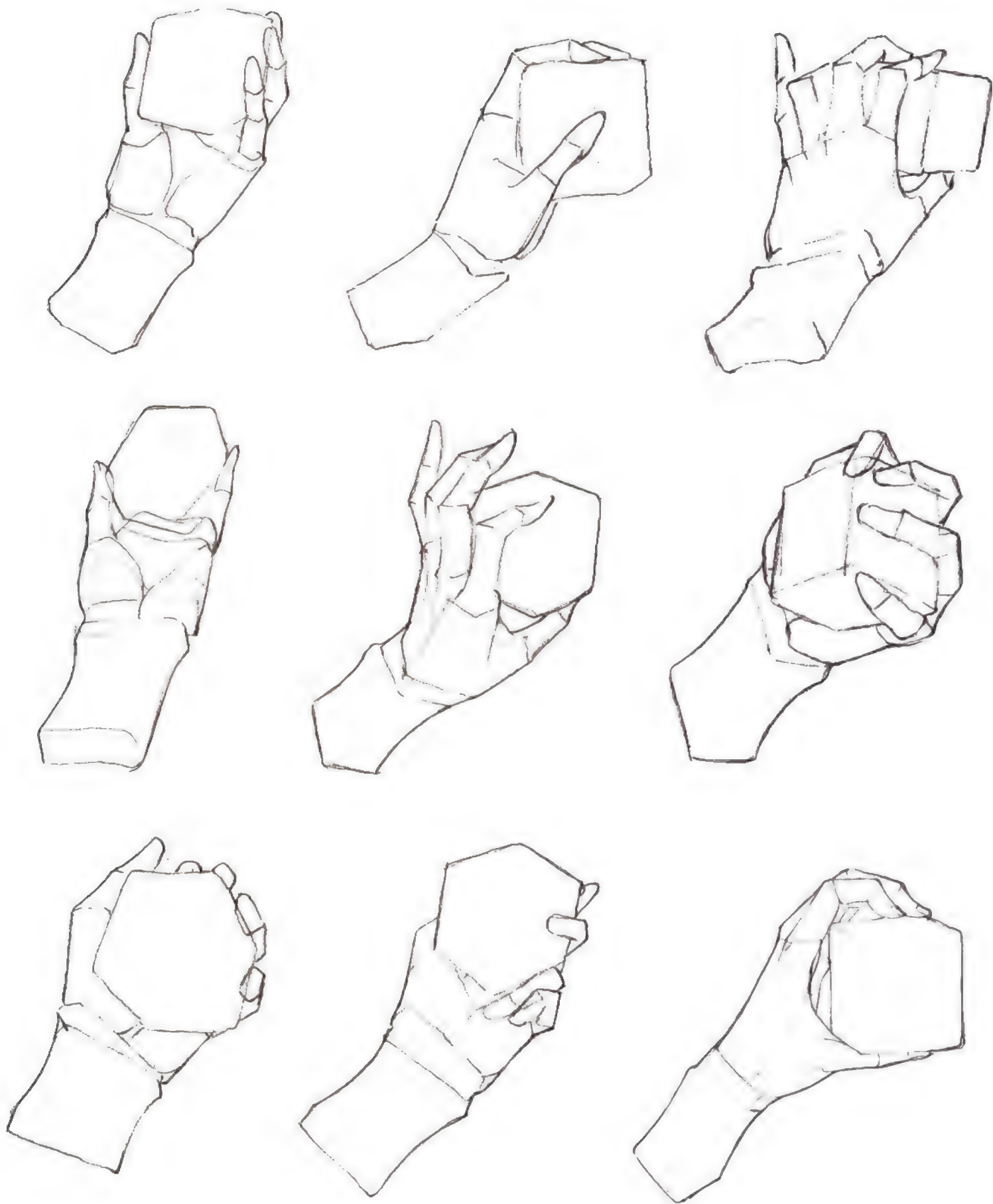
Point, and at the same time find the part where the finger is in contact with the object.



03

Clearly identify the perspective and solidity of each finger joint point. Finally, add details to the bracket.





It takes a lot of practice to control the hand that grasps the object. We can refer to the above picture and use our own hands to grasp a smaller object for multi-angle observation and drawing.

08

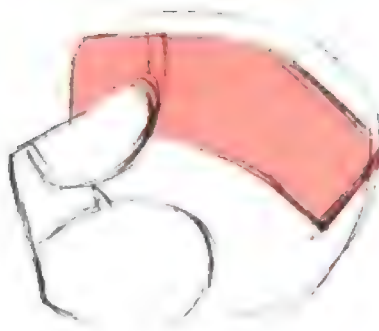
Hand drawing exercises for fists

◆ Drawing steps of the fist-shaking hand



01

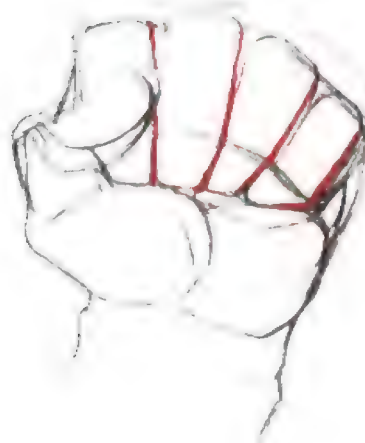
Determine the approximate shape of the hand and find the position of the big finger



02

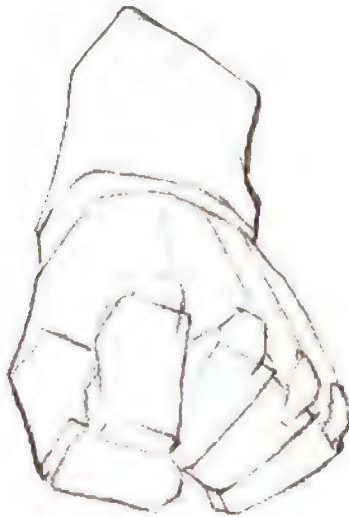
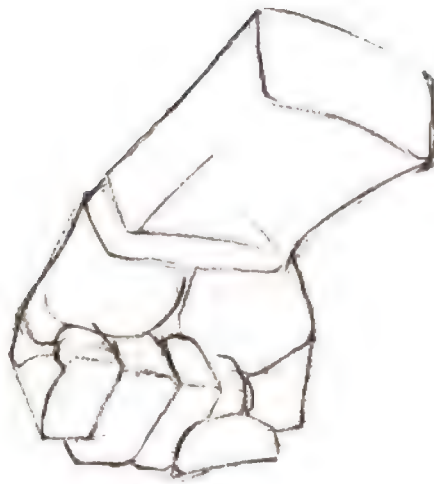
Determine the position of the remaining four fingers and the turning point of the four fingers

The formed surface



03

Divide the resulting plane to ensure the thickness of each finger
Reasonable, and finally characterize it.



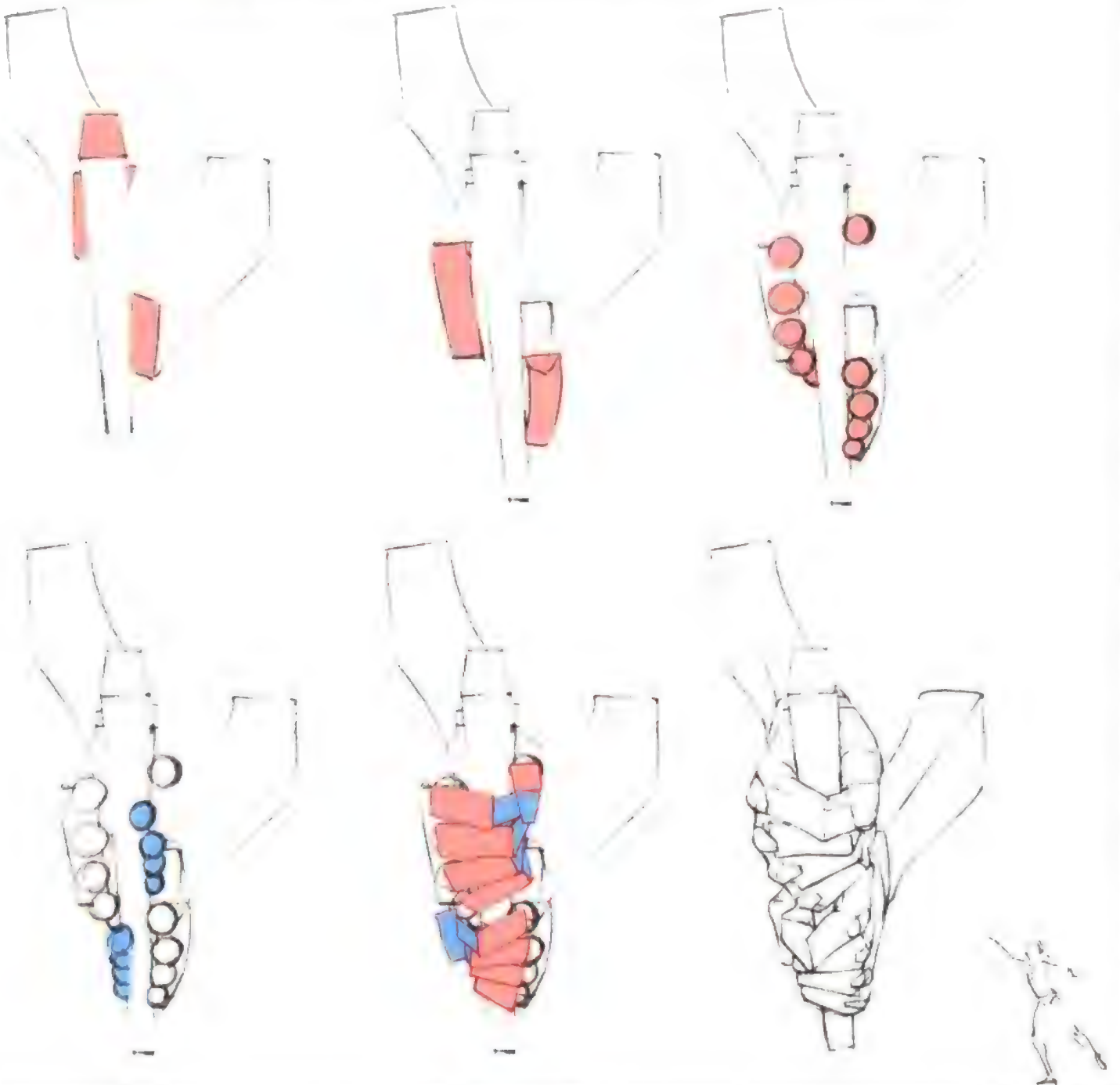
When drawing a fisted hand, we can pay more attention to the performance of the knuckle protrusions and the perspective relationship of each knuckle protrusion.

09

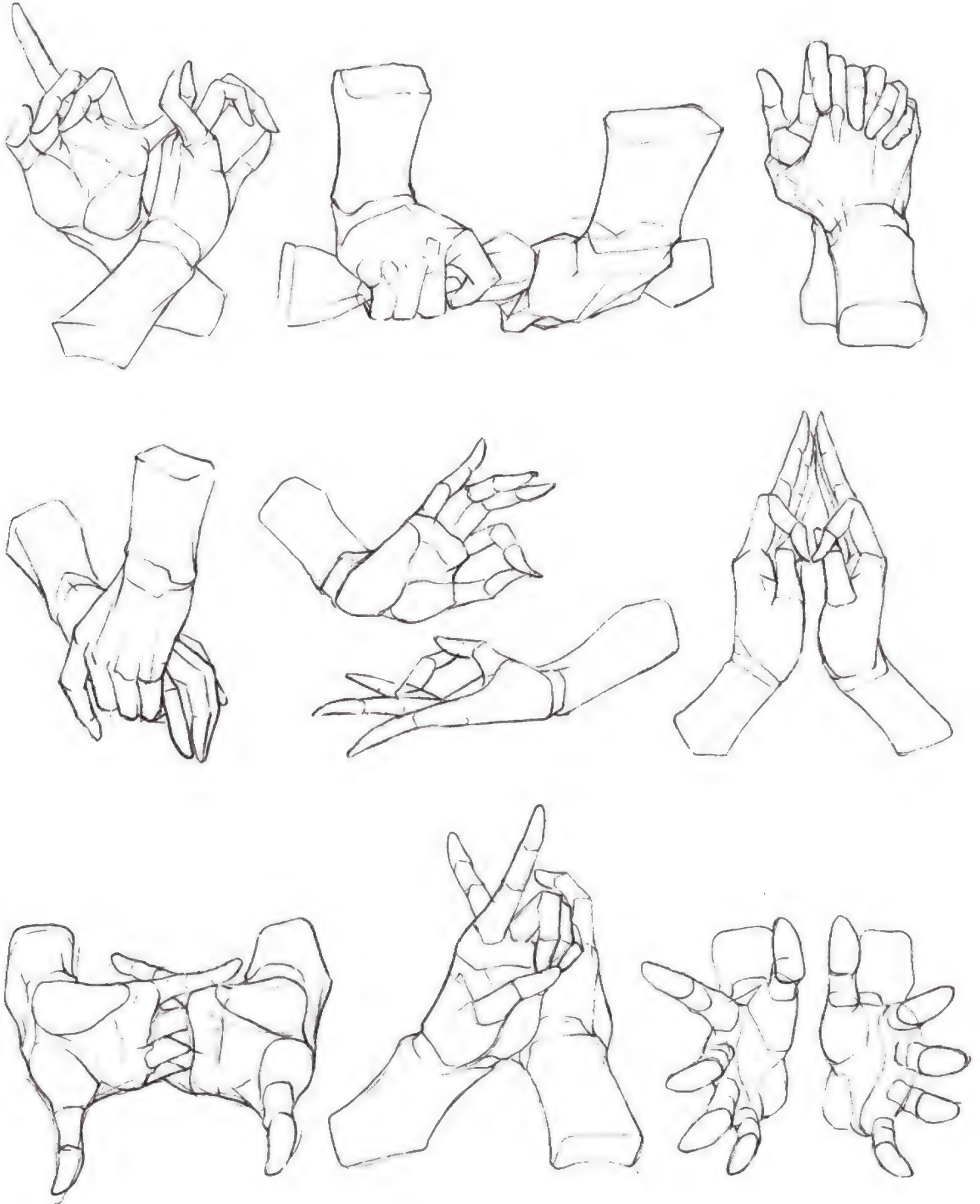
Two-handed drawing practice

First determine the perspective relationship of the anatomical descriptive relationship, and then use the red and black lines to express it. It is the subtle body relationship between the hand and the standing position of each finger.

Then find the turning point of the finger and treat the finger in a sheet. At this time, a more intuitive three-dimensional bracket will be obtained, and finally refined on this bracket.



It takes a lot of practice to master the drawing method of both hands. We can try to do "hundred-hand exercises" according to different needs. We can practice expressing the relationship between the hands first, and in this process we can focus on expressing the three-dimensional sense of the palm and fingers.



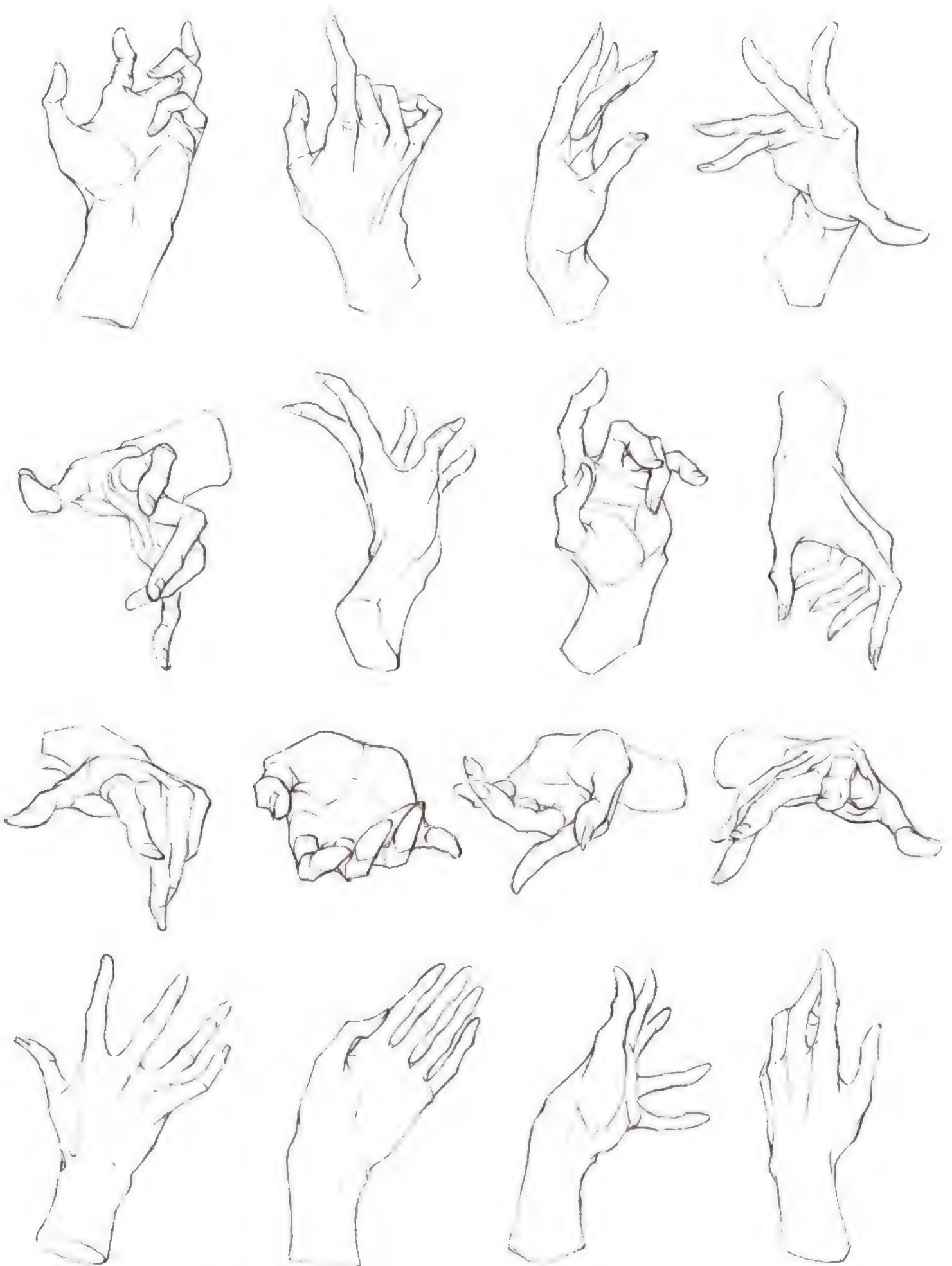
10

Different forms of hands



Master the drawing of the bracket of the hand to
After a certain level, we can try the opponent
Refers to beautification. Different starting methods will
Produce different drawing results, some fingers
The plane relationship presented in a particular situation is more
It looks good, we can do it when we start,
Generalize this plane relationship Manage,
and then divide the fingers in the shape range
Joints, and finally refine the various parts of the hand.

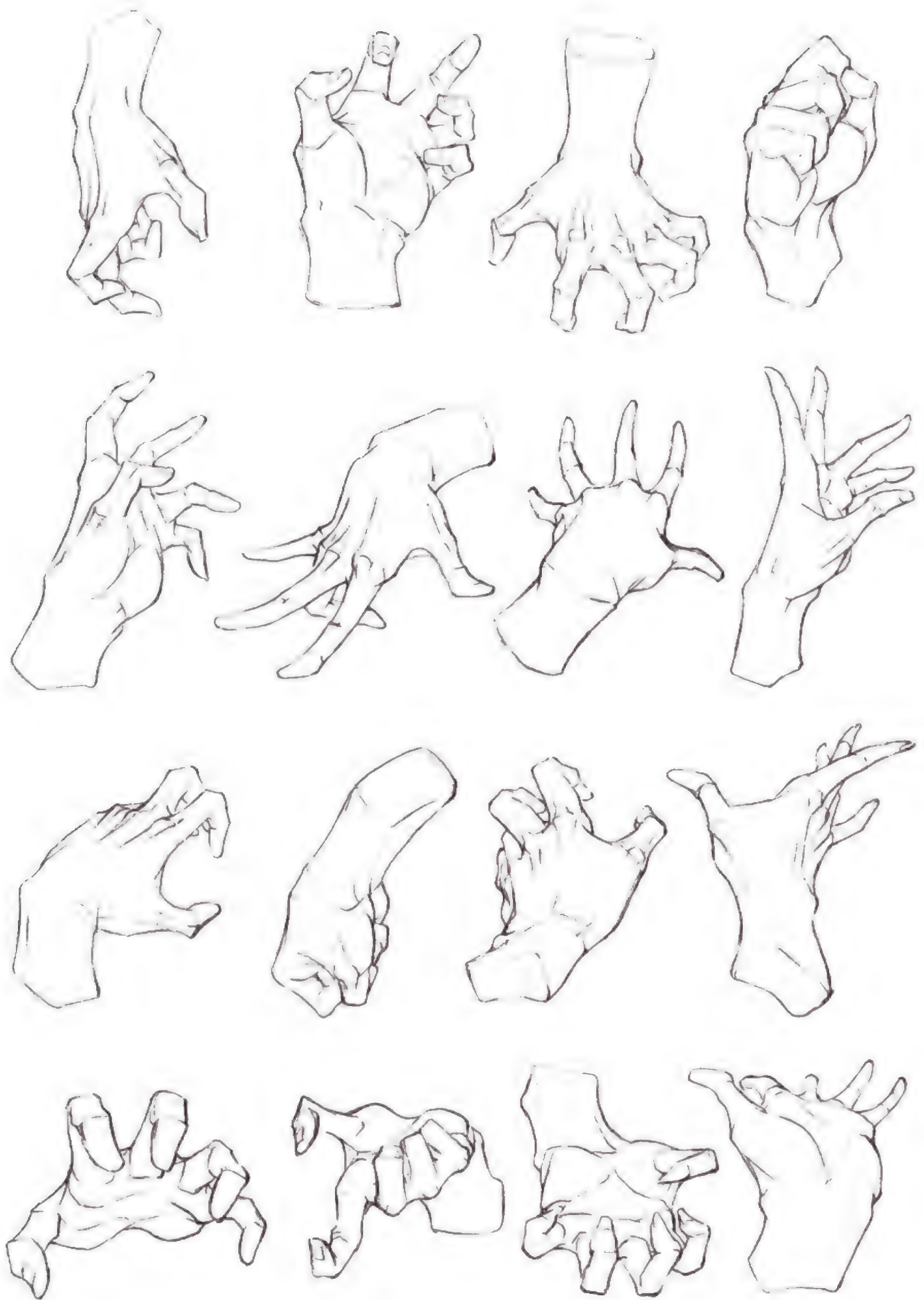
First, some finger joints are very beautiful,
We can also use no for finger joints. The same starting
method, and then turn off each finger The position of
the section and the state of performance are carried out
Refine the processing so that you can draw different
Performance of the finger.



We can draw different fingers referring to the picture above.



We can also refer to the above ancient gestures to practice drawing on fingers.



In addition, we can also refer to the figure above to practice giving powerful fingers.

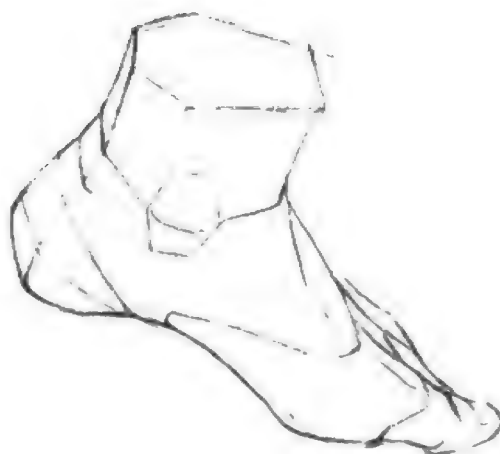
There are many ways to draw hands. When we master the relevant knowledge, we can draw the fingers we want to express.

11

Dismantling of the structure of the foot

We can disassemble the structure of the foot into five parts: foot, heel, sole, foot Number and toe.

The toes are not as flexible as the fingers. We should focus on understanding the three-dimensional relationship of the feet.
Position: draw the perspective of the feet at all angles.



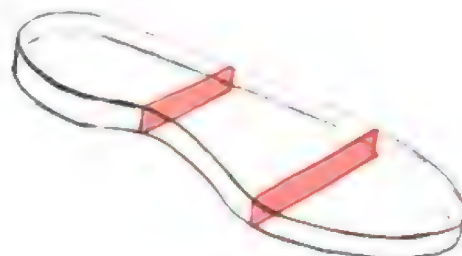
Foot heel

The relationship between the heel and the foot.



heel

When drawing the heel, you need to draw the heel and the foot together.
It depends on whether the drawing is accurate.



Sole of the foot

Drawing the sole of the foot can be done subsequently drawing the foot.



Arch of the foot

The arch of the foot is the key shaping part of the foot.



Foot 211

When making toes, you need to draw the perspective relationship of the toes clearly.



12

The proportional relationship of the feet

◆ Drawing steps on the side of the foot

01

Divide the straight line representing the soles of the feet equally.



02

Draw a square body at the end.



03

On the basis of this, the thickness of the soles of the feet is increased, and the increased thickness is roughly four-quarters of the thickness of the square body.

One of them



04

Divide the front end in two and connect the two points to the square body



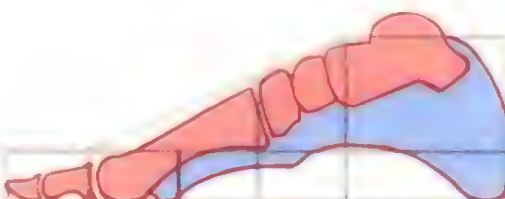
05

Draw the soles of the feet and connect the corners above with the semicircles, so that the transition of the sole of the feet. The bracket is drawn.



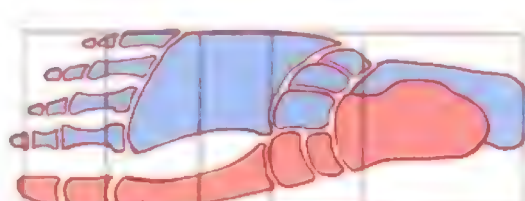
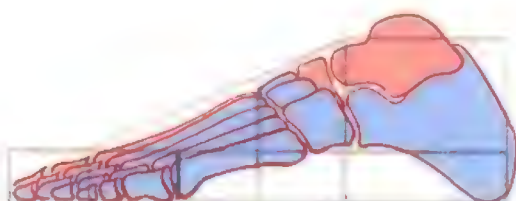
06

With such a basic bracket, it is easier for us to find these bone points when we draw foot bone points. The corresponding position



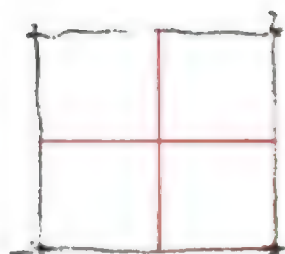
07

The ratio of the feet is not absolute, but we can better grasp it by mastering the general law of proportions. The basic form of holding the entire foot.



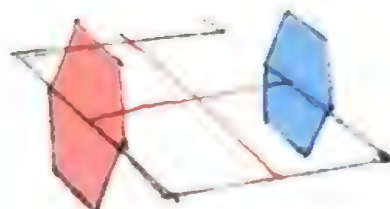
13

Structure of foot class |



01

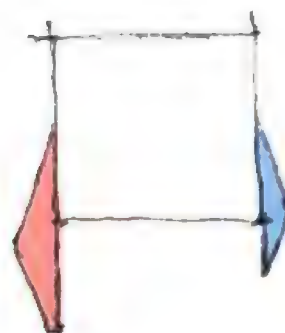
The mold cross-section of the foot can be regarded as a square.



02

Flatten this square and add two bone candies on the left and right sides.

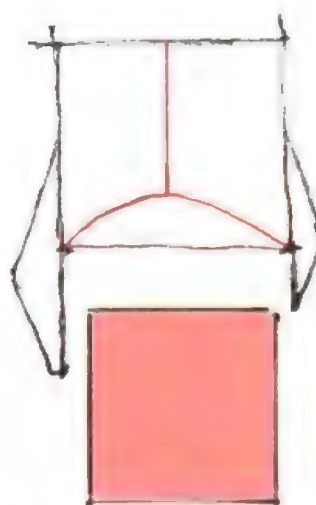
The protruding surface.



03

From the front, the protruding surface of the outer bone can is higher than that of the inner bone can.

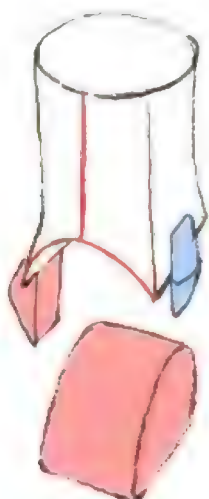
The face is high.



04

The foot is like a clip that clamps the starting point of the foot.





05

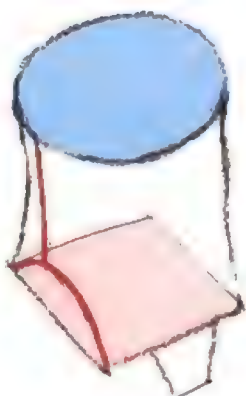
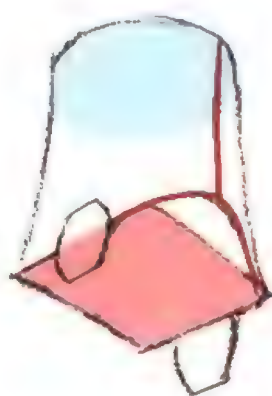
For another perspective, it is more convenient for us to understand the three-dimensional relationship between the two.



06

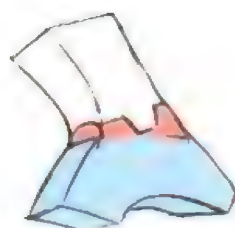
Whether the foot lesson is drawn accurately determines whether we can draw the structure of the foot well.

In order to better draw the structure of the feet, we can use the following structure diagram to practice drawing the perspective state of the feet from all angles.

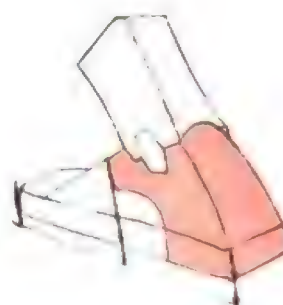
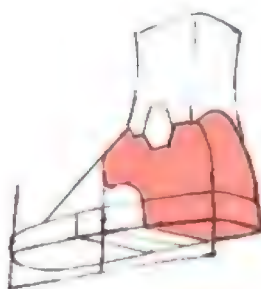
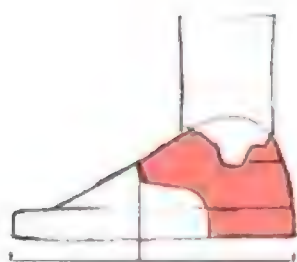


14

Structural points of the foot



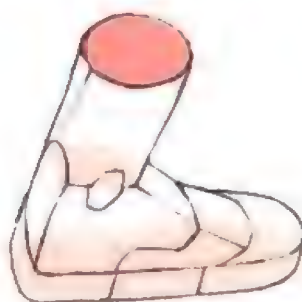
Have a certain three-dimensional recognition of sleeping on your feet. After knowing it, we can build on this basis. For the drawing of the heel, pay attention to the drawing. The three-dimensional relationship of the heel.



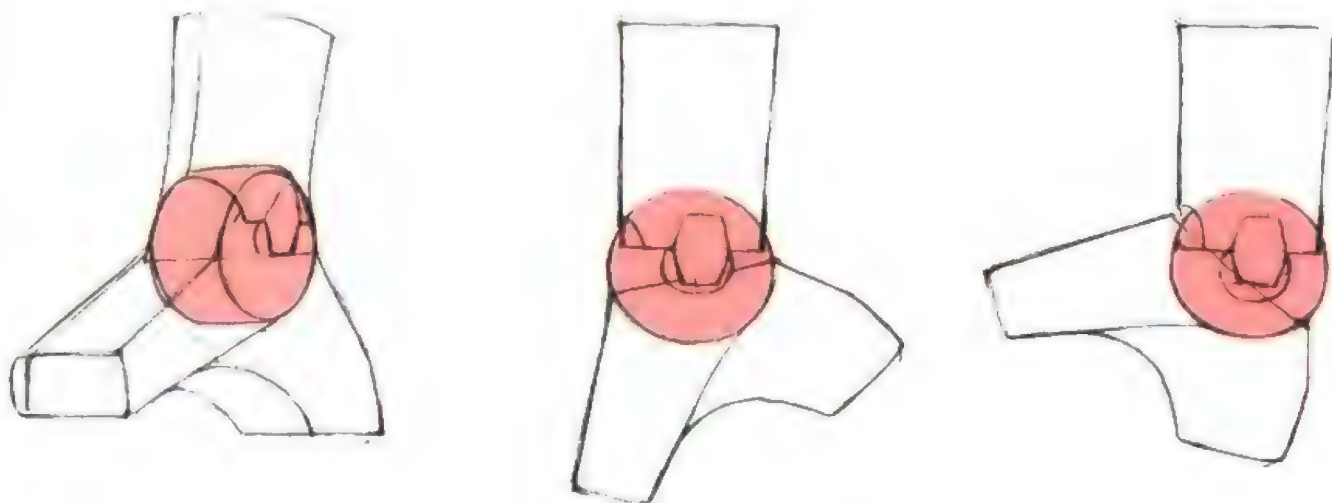
From the side, the proportion of the heel is off. The system is roughly as shown in the picture on the left: the length of the heel. The degree accounts for roughly two-thirds of the length of the entire foot surface. One of them. Use this proportional relationship. Master the perspective of the heel from all angles. Let's compare the perspective relationship of the foot control to that of the foot.



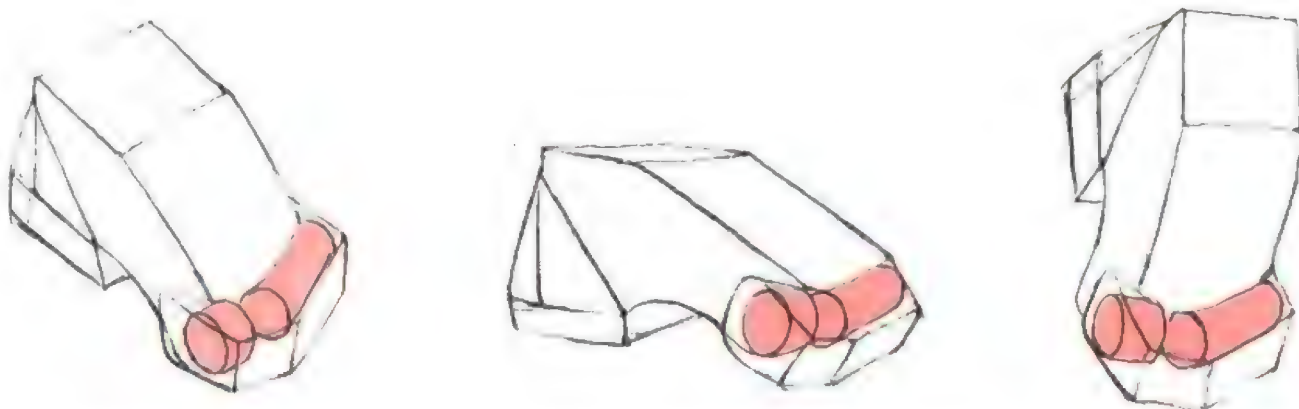
To control the perspective relationship of the feet, we can pay attention to the calves and ankles. The perspective relationship between the three sides of the soles of the feet; but the perspective relationship of these three aspects is manifested in position, it will be relatively simple to portray the feet.



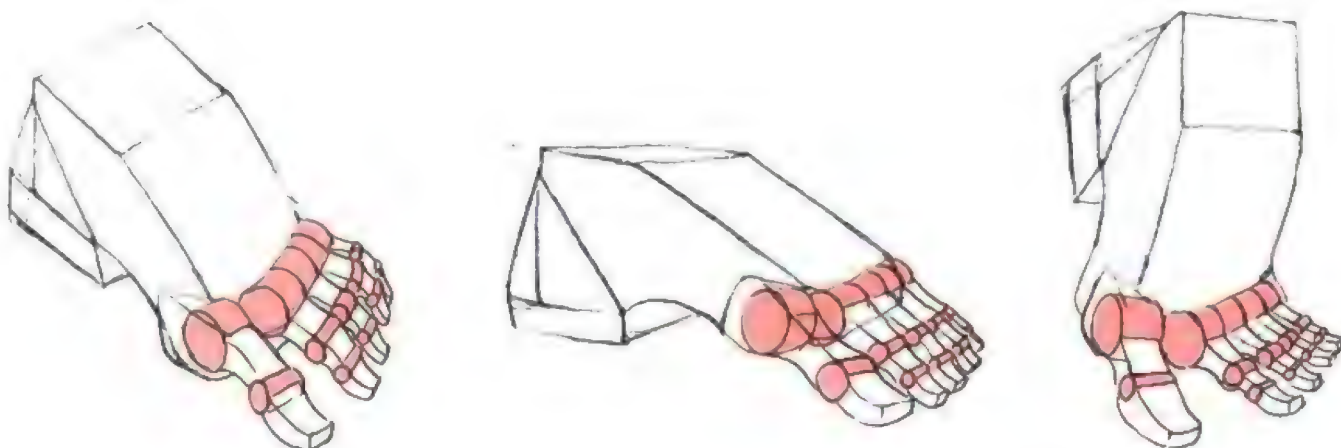
When moving, there are not many joints that move on the feet, which are mainly concentrated in the following three parts.



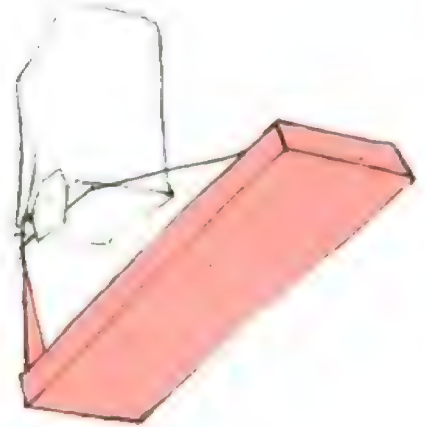
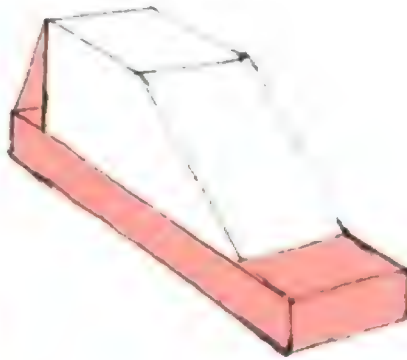
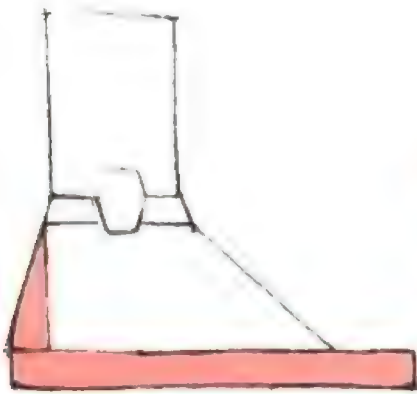
Foot class We can think of the joints of the feet as cylindrical gears, and the movement of the feet needs to rely on these joints.



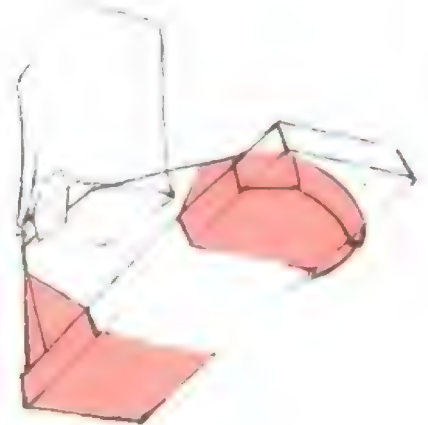
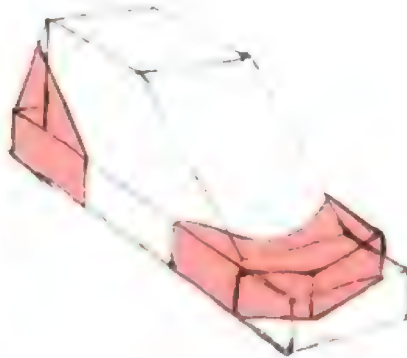
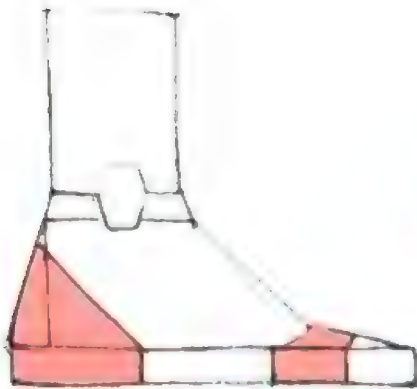
At the starting point of the toe, we can divide the starting points of the big fingers and the remaining four toes, so that we can generalize when drawing the feet.



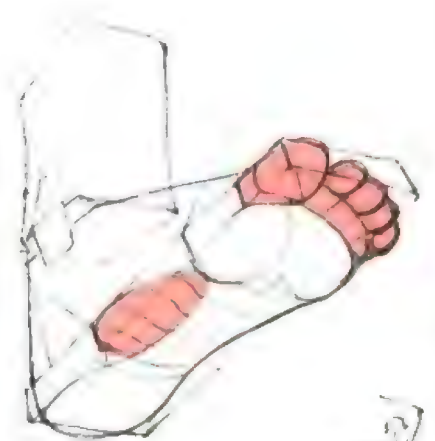
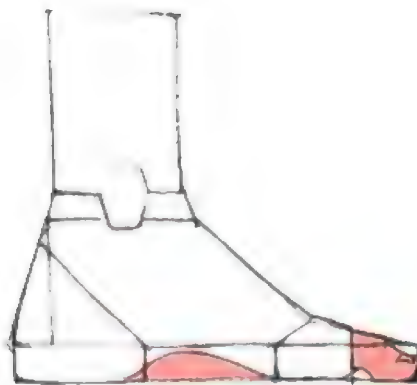
At the toe The big toe has only two joints, and the other four toes have three joints, but these four toes change very little when they are active, so when we draw it can be generalized.



When we have a certain understanding of the joints of the feet, we can try to perform a simple geometric treatment of the feet, and first grasp the perspective state of the overall representing the soles of the feet at all angles



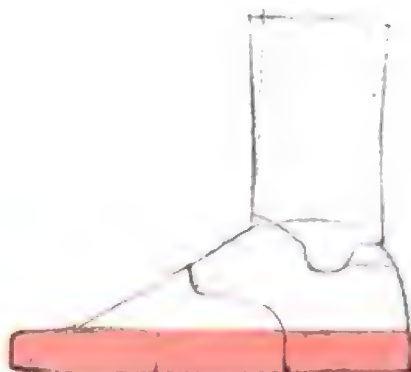
(On the basis of the above geometry, find the starting areas of the heel and toe respectively, and perform simple geometric construction of these two pieces)



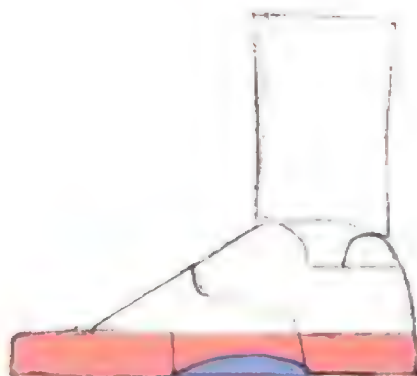
Finally, by observing a third angle, we can grasp the feet from the front and back, and we can grasp the feet from the side of the feet



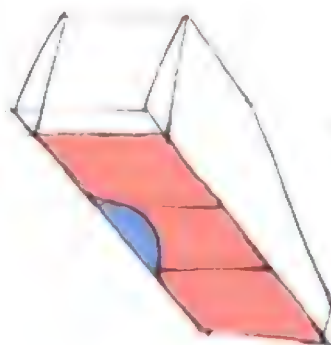
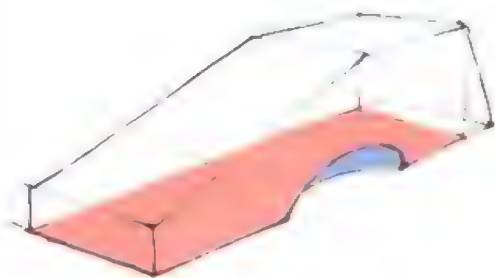
When we draw our feet, we should pay attention to the structural changes in the soles of the feet.



Viewed from the outside, the soles of the feet are relatively flat.



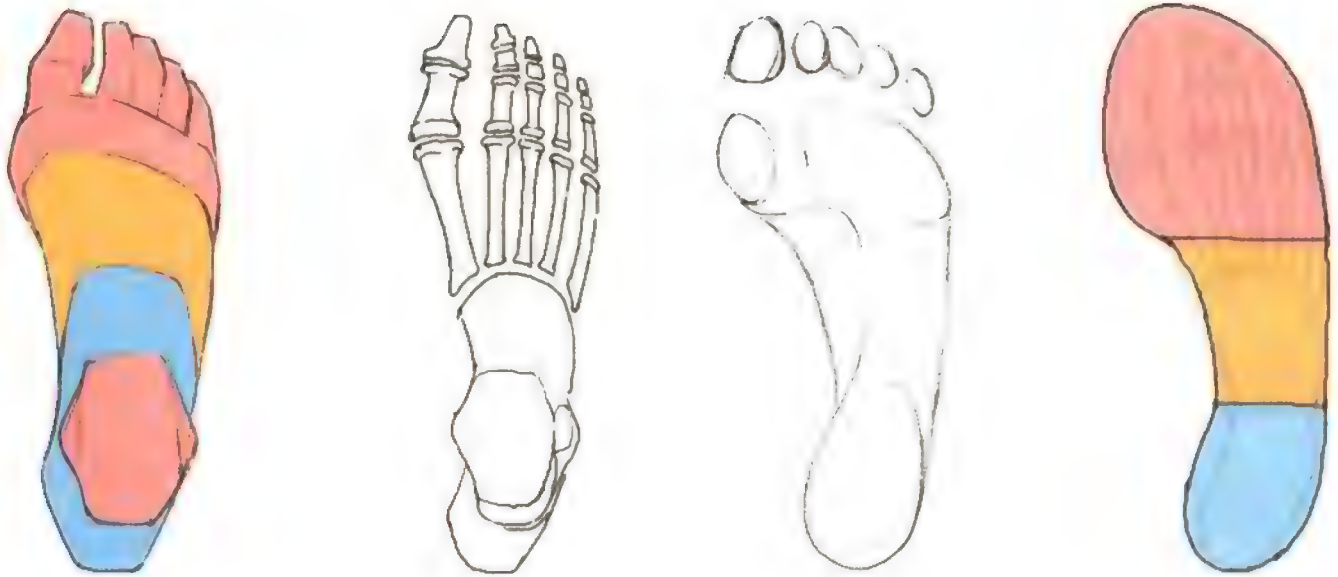
The arched state of the arch of the foot can only be seen from the inside.



We can think of the foot as a trapezoidal structure. Dig out an arched area in the center below.



In order to better represent this area, we can To simply divide the soles of the feet in three equal parts

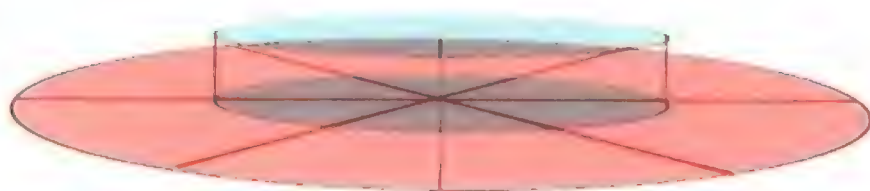


Dividing the bottom of the foot into three parts can facilitate us to simplify the structure of the foot, and on this basis, the arch of the foot can be described to help us better draw the movement state of the foot.



15

The spatial relationship between the foot and the ground



We can simply put the space between the feet and the ground. The relationship is understood as the perspective relationship of the geometry shown in the figure on the left. First draw a circle and draw one in the center of the circle cylinder.

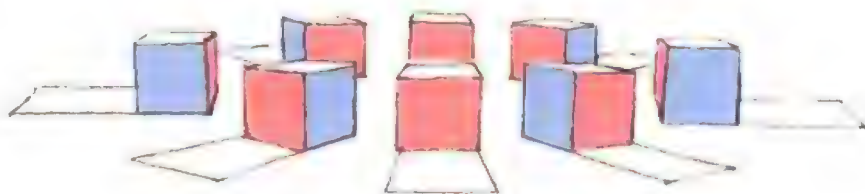


Find the perspective relationship between the soles of the feet in different orientations

1 Draw a perspective surface



Shape the height of the heel on the perspective surface.



Based on the height of the heel, increase the thickness.



Finally, add the inclined surface of the instep and draw the toes. The thickness of the ladder can be obtained one by one with different orientations. Shape structure.

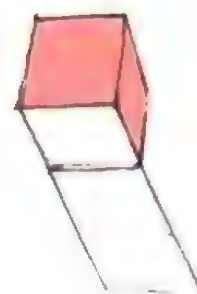
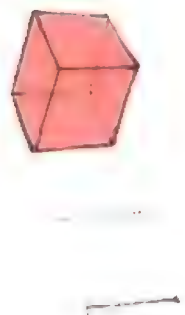
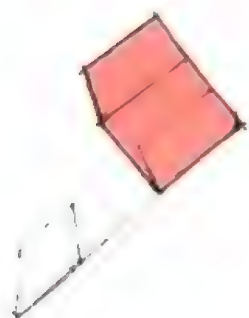
16

Foot drawing steps



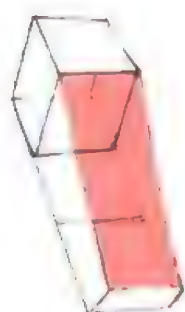
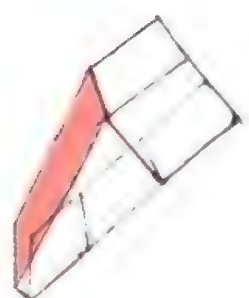
01

We connect the knowledge we have learned in series, and first determine the generation of the soles of the feet.
Depending on the situation, divide the soles of the feet equally.



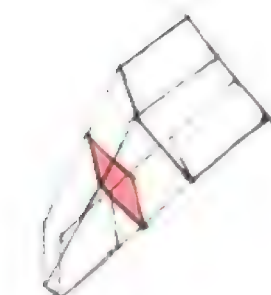
02

Shape a square body at the end to determine the perspective of the heel status.



03

Then shape the thickness of the toe and connect the upper end with the heel.
Connect the dots to draw a trapezoidal structure.



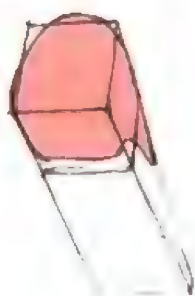
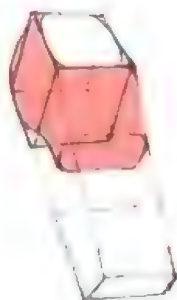
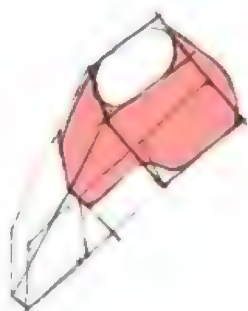
04

Find and mark a cross-section at one-half of the soles of the feet.



17

Foot drawing points



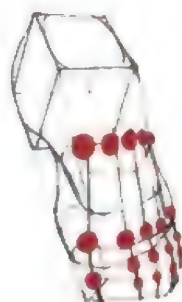
01

With the cross-section as a reference, the heel is detailed shape.



02

Mark the area where the toe starts



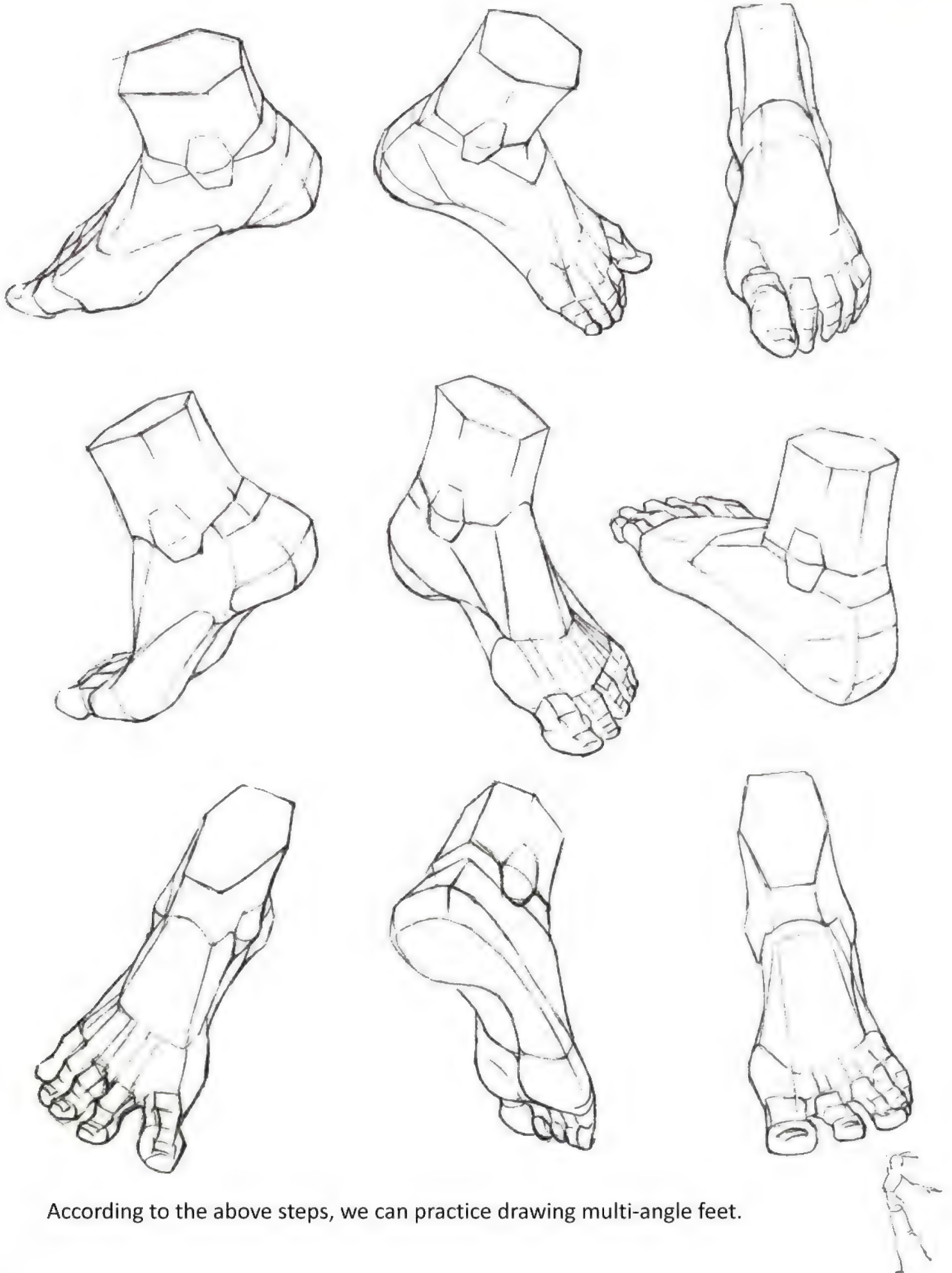
03

In order to better shape the foot address, we divide it by points and lines
Out of the position of each toe.



04

On the basis of the above geometric structure, then the entire foot
After trimming the contour and structure, you can get different orientations
The feet.



According to the above steps, we can practice drawing multi-angle feet.

18

Shoe drawing practice

◆ Steps to draw shoes on the structure of the feet



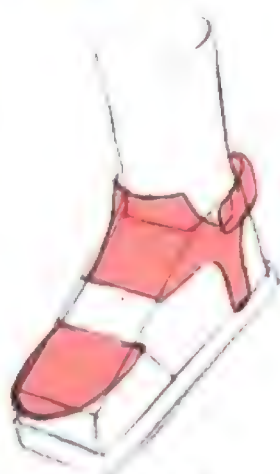
01

So we can use simple feet first The geometry is summarized.



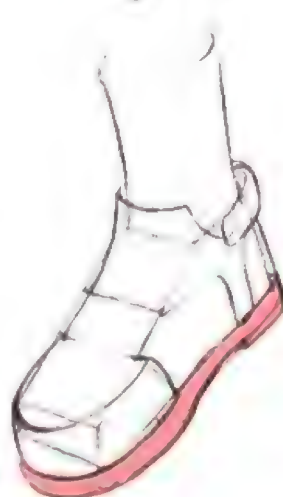
02

Mark the area where the ankle and heel turn



03

Draw the corresponding shoes in each position
Structural design



04

Generalize the structure of the sole.
Refine the upper.



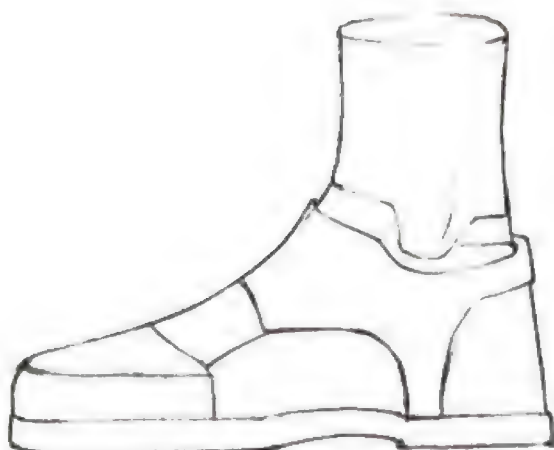
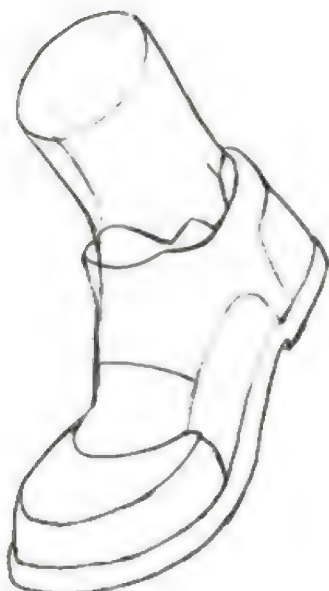
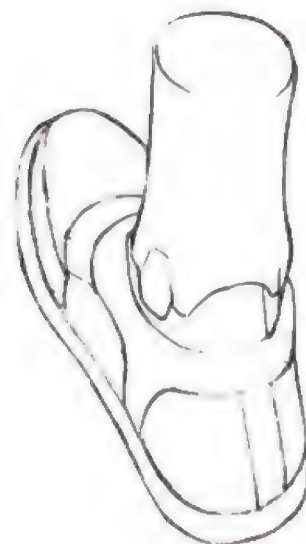
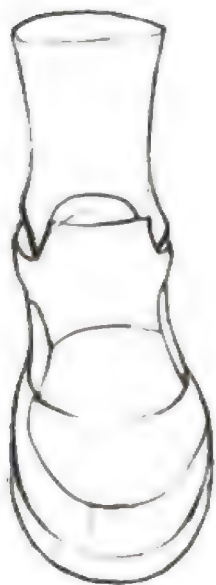
05

The arch of the foot is shown in the above structure
Arcuate lineiness



06

When the feet are moving, the main ones on the feet
The active and squeezed part is concentrated in the arch of the foot
The area of convergence with the toes, draw shoes To reflect this kind of activity and squeeze



Through the above steps, we can try to draw the basic bottom shape of the shoes from all angles.



◆ 绘 Steps to make different shoes

01



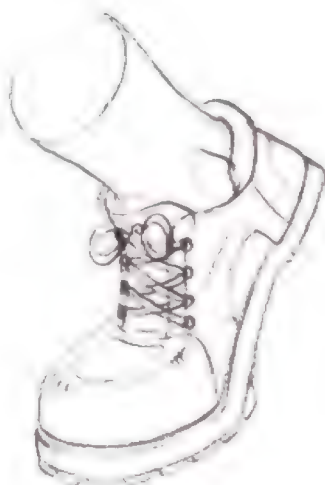
We can use the basic bottom shape of the shoes to make different shoes.



02

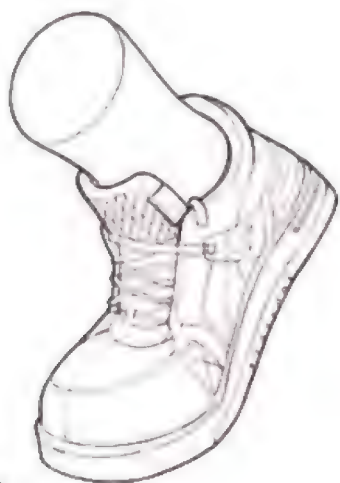
Draw the correct perspective relationship between the shoe mouth and the shoelace, and draw the shoes. When wearing it, you can use the previously identified arm softness.

03



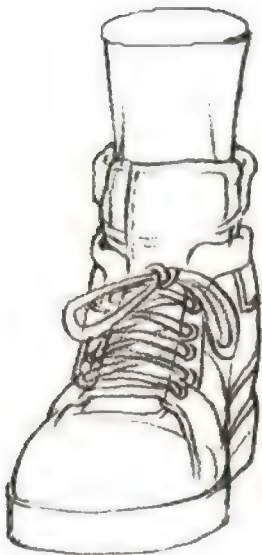
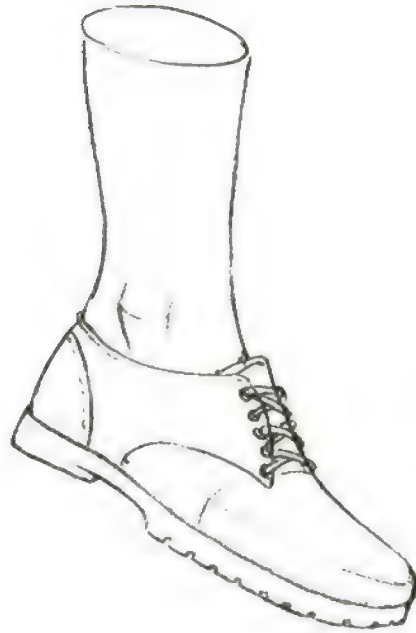
Refine the shoes and you will be able to draw the foundation of the shoes soon structure.

04



Different shoes can be drawn using such a basic bottom shape, because the basic bottom shape of shoes is generally not much different.





We can also observe different shoes in reality and do more drawing exercises of basic bottom shapes.



◆ Steps to draw shoes directly

01

Make a flat summary of the shoes.



02

Draw the vertical three-dimensional relationship of the upper and the spatial relationship between the shoe and the ground.



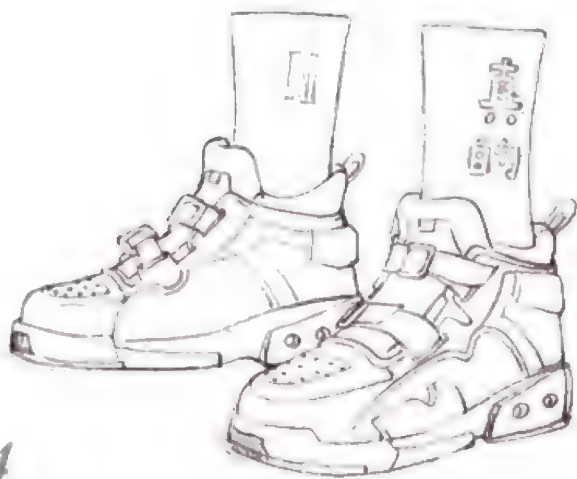
03

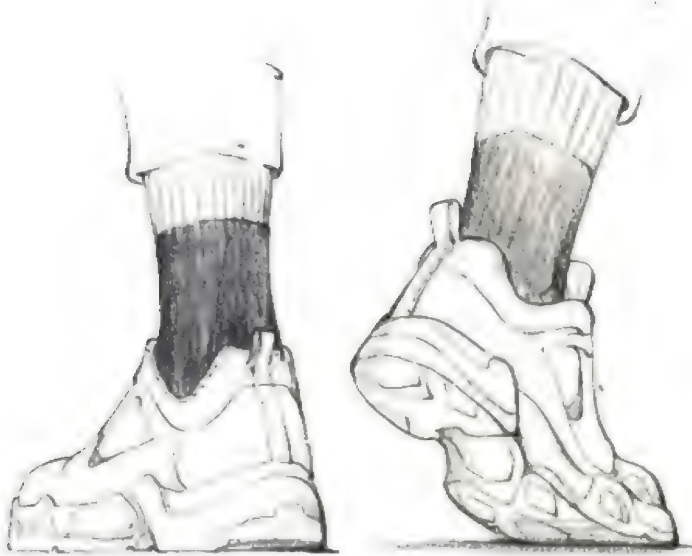
Divide and refine the structure of the shoes. When refining, focus on drawing the structural relationship between the shoe mouth, shoelace and sole.



04

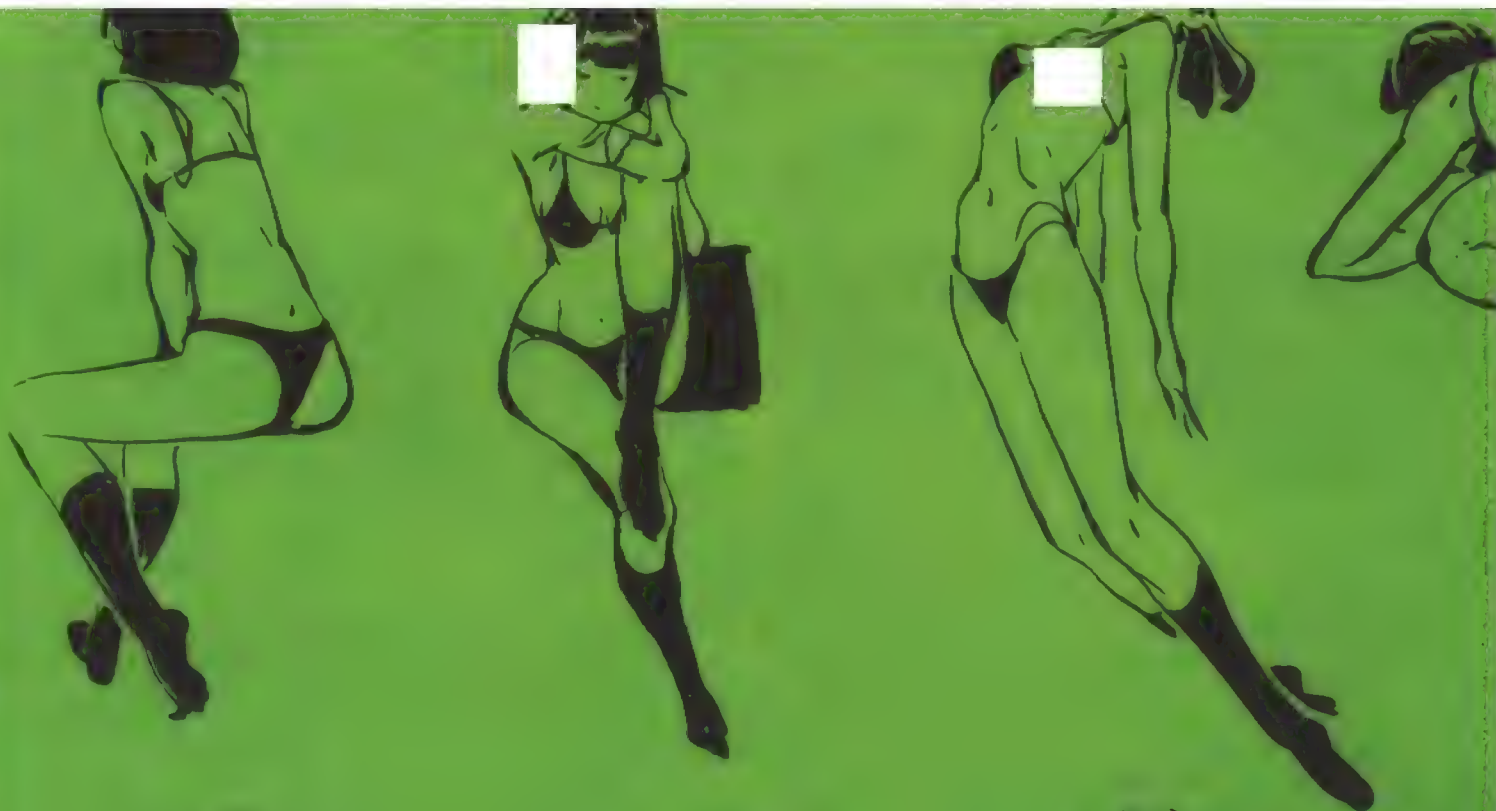
Add corresponding details to each area of the shoes, add some tones and small twists, deal with the shadow relationship, and a pair of shoes will be drawn.





When we draw shoes, we can try to draw them one by one, and master the spatial relationship between the shoes and the ground.





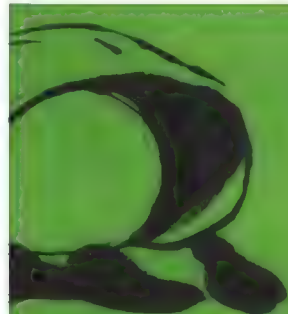
Chapter Six

人体支架

练习

Body
Scaffolding
Exercises

- 一、打开人体和重力
- 二、打开人体和重力
- 三、打开人体和重力
- 四、打开人体和重力
- 五、打开人体和重力
- 六、打开人体和重力
- 七、打开人体和重力
- 八、打开人体和重力
- 九、打开人体和重力
- 十、打开人体和重力
- 十一、打开人体和重力
- 十二、打开人体和重力
- 十三、打开人体和重力
- 十四、打开人体和重力
- 十五、打开人体和重力
- 十六、打开人体和重力
- 十七、打开人体和重力
- 十八、打开人体和重力
- 十九、打开人体和重力
- 二十、打开人体和重力



01

Cube man drawing practice



01

Draw a basic stickman.



02

Mark the position of the shoulders.

膀 The position of the shoulders



03

Mark the position of the hips.

胯 The position of the hips

The solidness of a round section is corrected



04

Draw the head, chest cavity, chest

The thickness of these three areas,

Then draw the thickness of the limbs



05

Put the head, chest cavity and abdomen

The round section is shaped into a square Section, get the cube person's

Dimensional shape



06

Respectively in the head and chest cavity

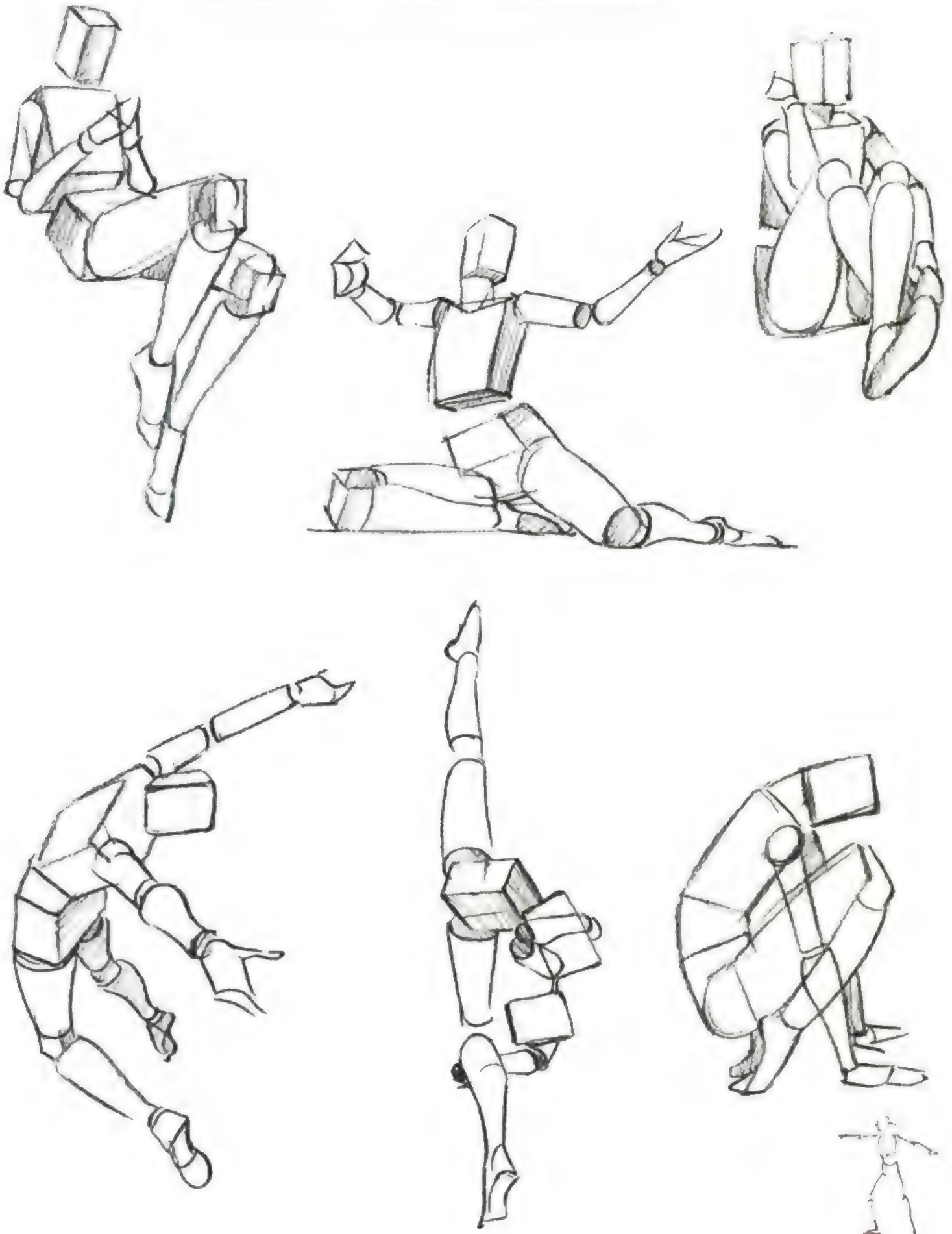
Tengbu performs a simple structure

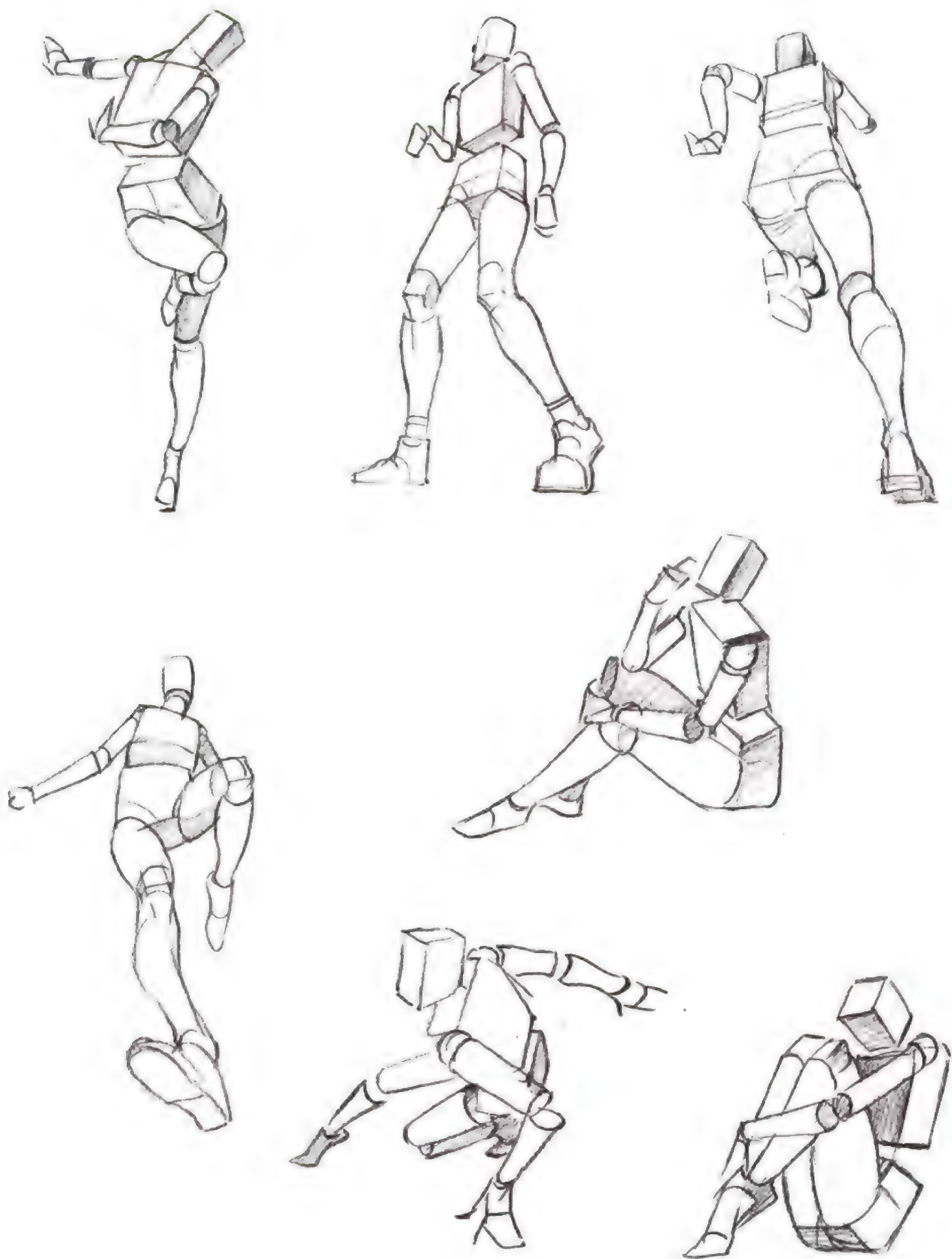
Divide and refine the limbs and

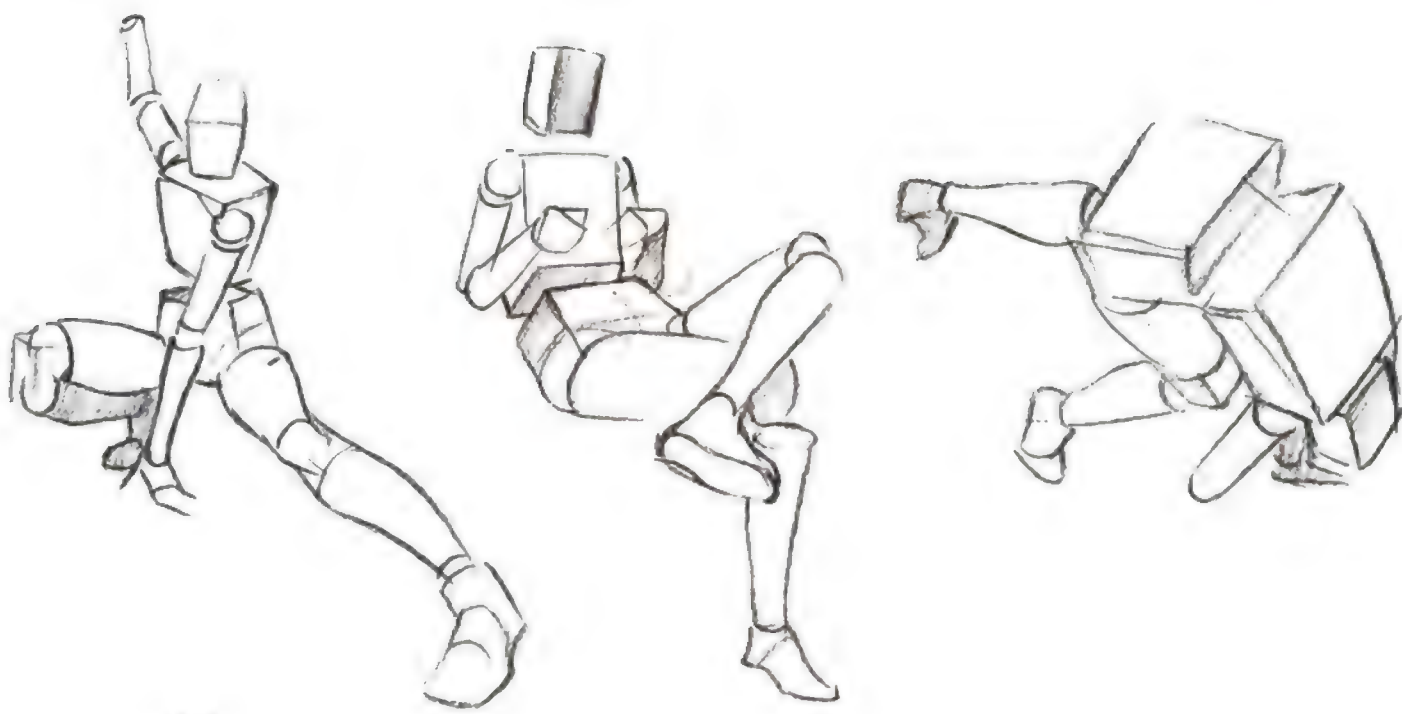
Feet, the cube man is finished drawing

It's done.

Conceptualizing and sketching the pose of a character in a dynamic pose.







02

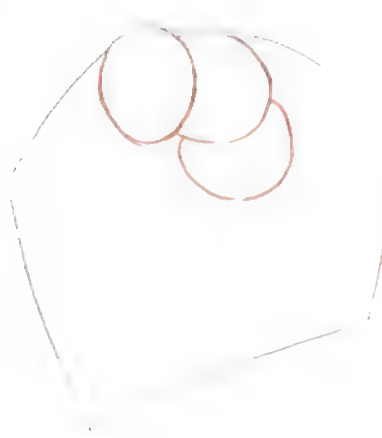
Square figure drawing practice from memories

◆ Square figure drawing practice from memories



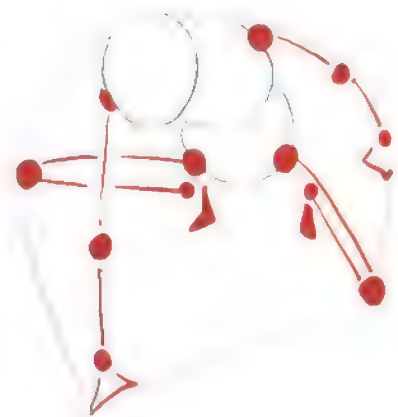
01

Draw a flat shape randomly on the left paper.



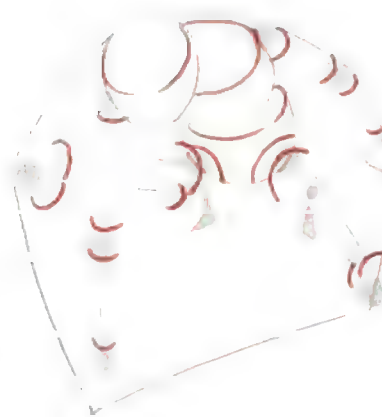
02

In the plane shape, draw three circles representing the head, thorax, and bladder, and try to draw the relationship between the front and back of these three circles.



03

When the position of the torso is correct, draw the four glues and mark the joint points of the four glues. When drawing the four glues, try to fill the entire plane with the four glues.



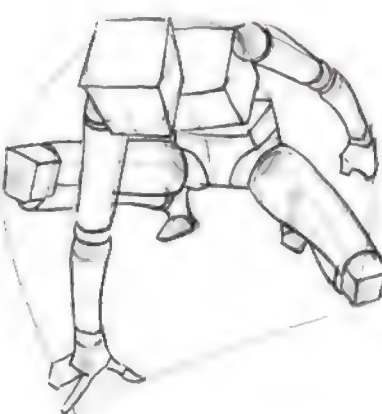
04

At each joint point, draw out the arc orientation of the four glues, and draw the molded sections of the head, thorax, and bladder.



05

Mark the orientation of the head, chest, and bladder and draw their thicknesses, and then draw the thickness of the four gums and the feet.



06

By performing block processing on the above basic structure, a more vivid and natural block man can be obtained.

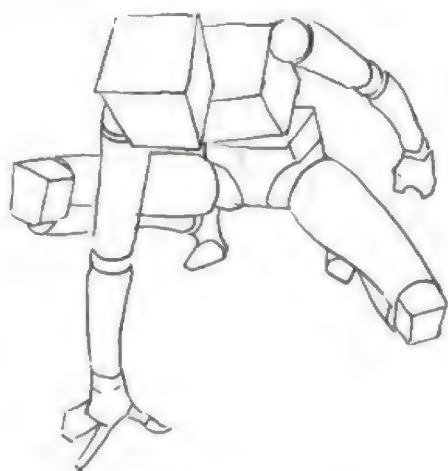


After the square people drawn by Mo have different shapes, their dynamics will be more unique.

03

Add exercises for cube muscles

◆ Steps to add human muscles



How to be in the square
Add on the basis of people
Muscle?



01

On the basis of cube people
Find the cross on the drive dry
centerline.



02

In the head, chest cavity and cross section
These three parts are simple. Summarize
the basic shape of bone strategy. State
and then draw the size of the ears
To the corridor.



03

Draw the main joints. Muscle
connection relationship.



04

Draw the four limbs separately
muscle.

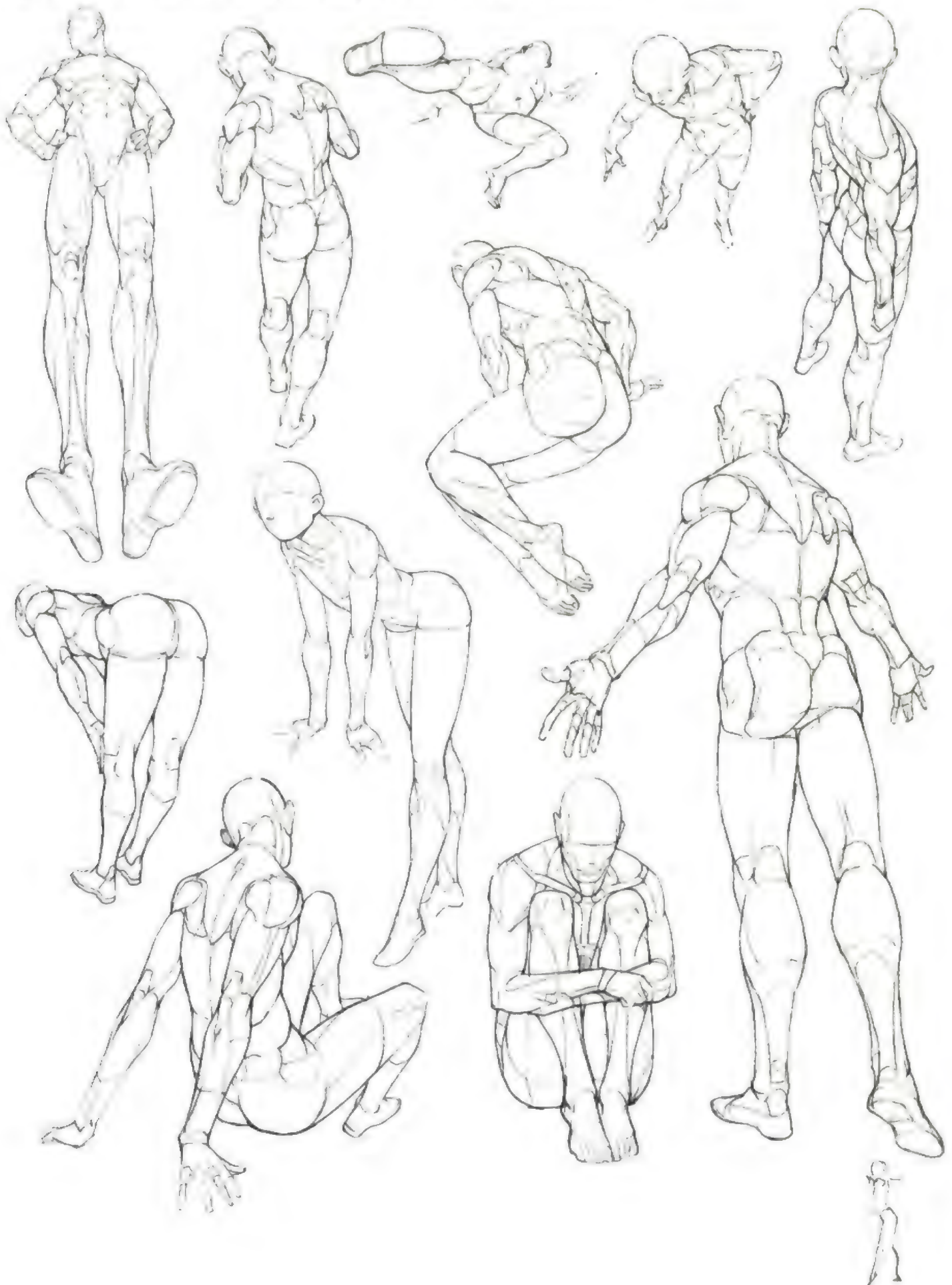


05

Further refine the muscles, and then
Post-processing lines

When drawing muscles, be sure to pay attention to the joints
Whether the perspective relationship is accurate

We can add muscles on the basis of the square people we practiced drawing before, so that the muscles drawn will appear more vivid.

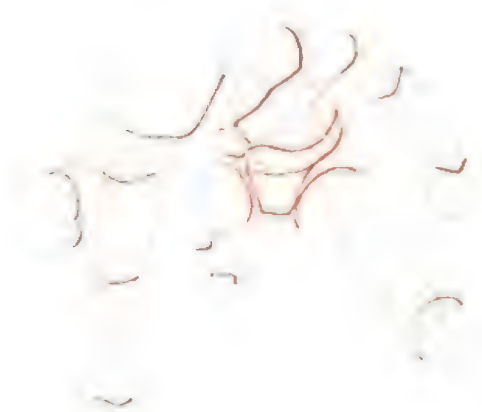


04

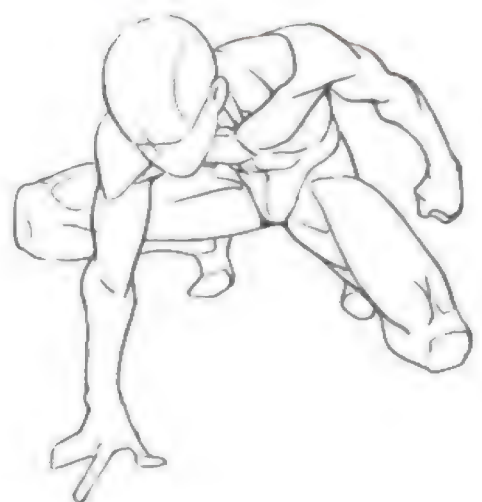
Human muscle simplification



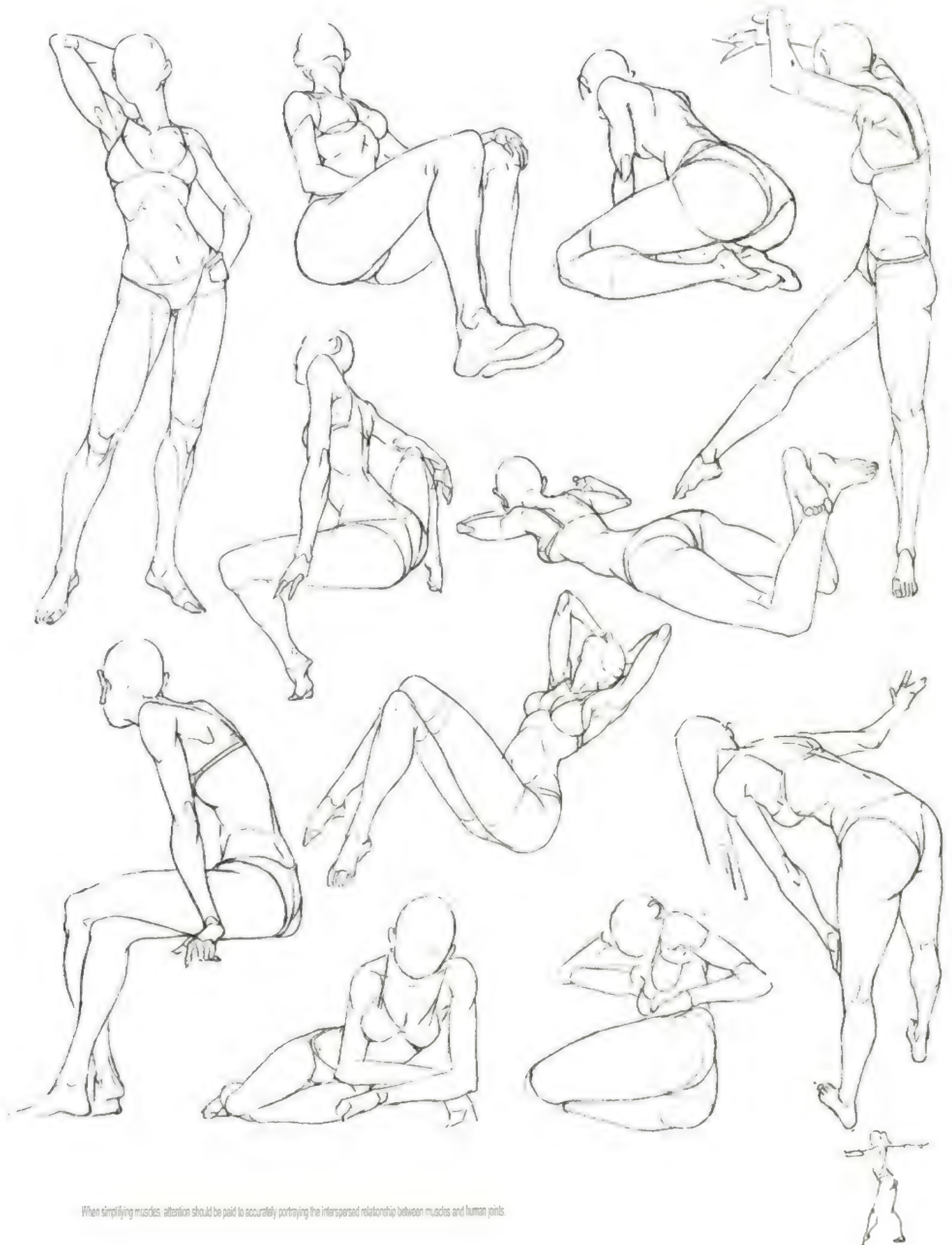
To make the structure of the human body, you don't need to draw every muscle. Come, otherwise it will make the human body look extremely unnatural. So i We have to simplify the muscles.



Before simplification, we need to clarify the curvature of the joints of the human body. Whether the painting is in place. Want to draw a vivid and natural human body structure. When adding muscles, focus on the performance of the muscles at each joint point! Ups and downs.



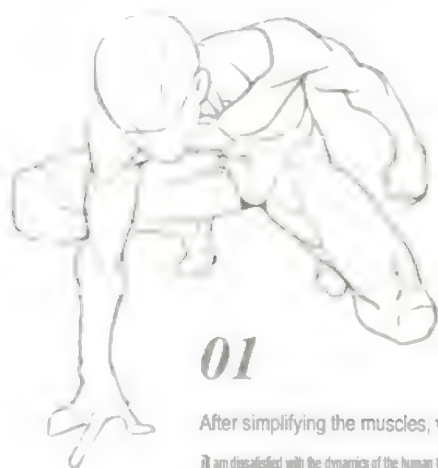
After we have clarified the loneliness of each joint point, in the human body When the upper shaping muscles are interspersed with lines, you can follow the previous logo The solitude draws the muscles on the corresponding joint points, and the joint points are The outer muscles can be simplified, so the muscles drawn in this way It will be closer to the real human muscles.



When simplifying muscles, attention should be paid to accurately portraying the interspersed relationship between muscles and human joints.

05

Adjustment of human body dynamics



01

After simplifying the muscles, we tend to still be right

I am dissatisfied with the dynamics of the human body drawn.



02

The key to adjusting the dynamics of the human body lies in the
Loneliness is adjusted.



03

Many times, the curvature of the joint point is correct, but it is obtained from this
The dynamics of the human body are not natural



04

Then we can try to adjust the curvature of each joint point. Orientation and
radian size. After adjusting the loneliness, treat people again. The body
is depicted in detail, and the human body dynamics obtained at this
time. It will give people different feelings.



When creating a series of human figures, we can try to adjust the similarity of the joints of the human body.



06

Quickly draw human body dynamics

◆ Steps to quickly draw human body dynamics



01

Draw the area where the human body is located.
The framework.



02

Draw separately in the frame to represent the head and chest. The position of the circle of the three parts of the cavity and abdomen. Make sure their location is correct.



03

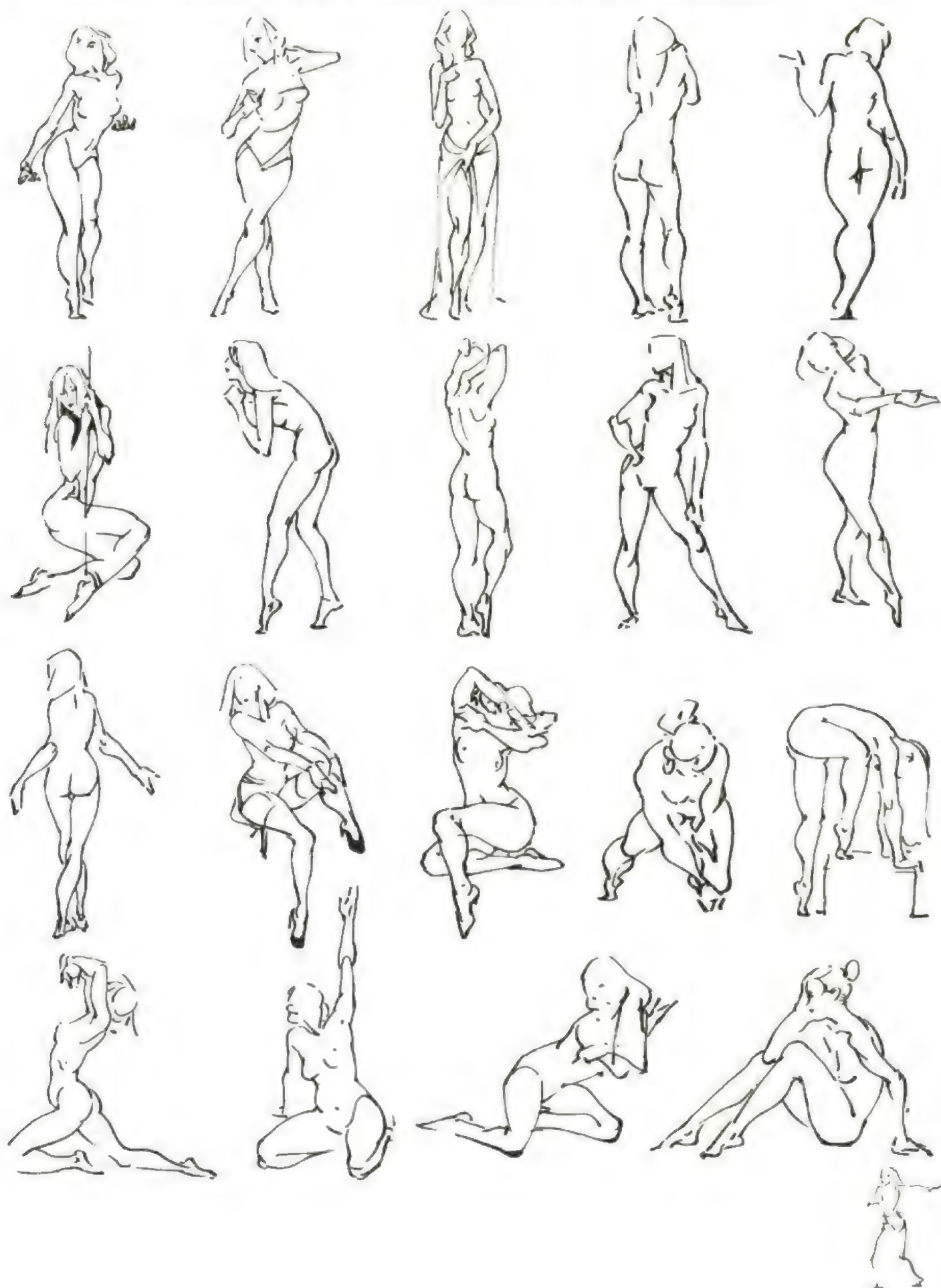
Identify the joint points on the limbs. In order to avoid the marked points from being separated from the limbs, some simple methods can be used. The plane shape of the single generalizes the human body and finds the corresponding position of the point.



04

Shape the ups and downs on the joints, engrave. Draw the thickness of the human body, and finally use a | smooth. Connect the lines and refine the parts, you can. To quickly obtain a more general human body dynamics.

Doing the following character-making exercises can enhance our feeling of the plane positions of the characters, which will play a great role in sketching beautiful characters in the future.



If we have a strong ability to control the plane, we can use the plane to summarize the characters and identify the interspersed lines on each point. This is also to be familiar with and control people. A better entry point for body structure.



07

Draw the human body in different shapes .



01

Draw different levels at will on paper
Surface shape



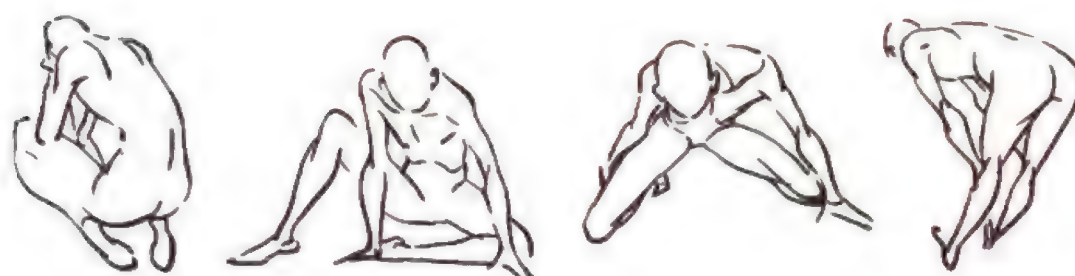
02

Draw in these flat shapes separately
Make different parts of hands



03

Draw the front of the human figure
Make different poses



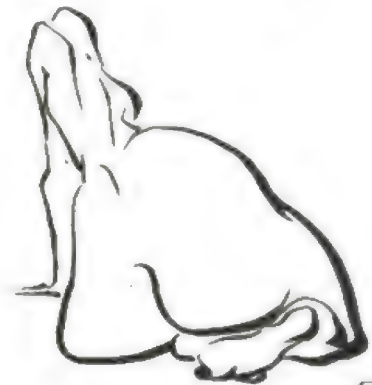
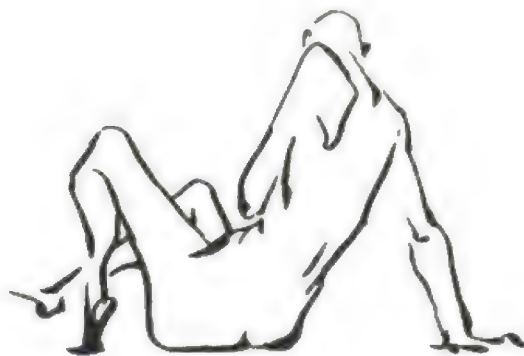
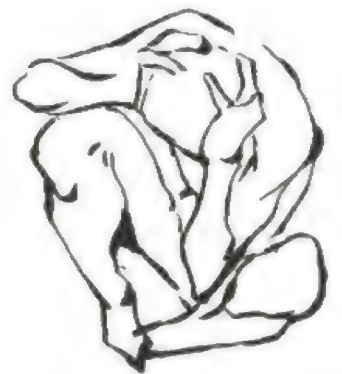
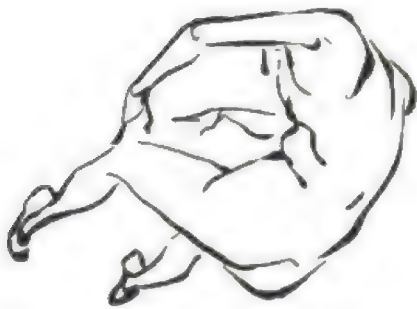
04

Draw the back of the human figure
Pay attention to the movement of the body



Painting the human body in different poses allows the artist to use it to create more dynamic and expressive compositions in the future





08

'Sketch of female characters



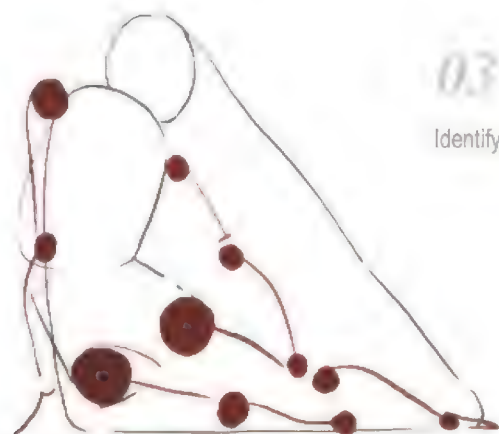
01

④ A simple plane shape.



02

Draw on the basis of the plane shape. Represents the head, chest cavity and cross section.
A partial garden



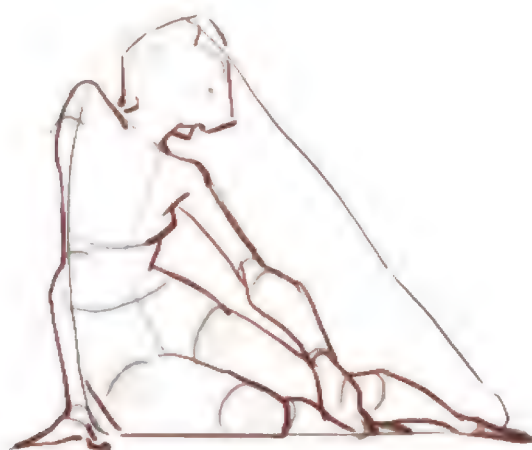
03

Identify each joint point.



04

Continue to draw the body structure.



05

After the completion of the body structure, draw the shoes.
The figure is a crouching female figure.
The shoes are drawn in black lines.
shoes

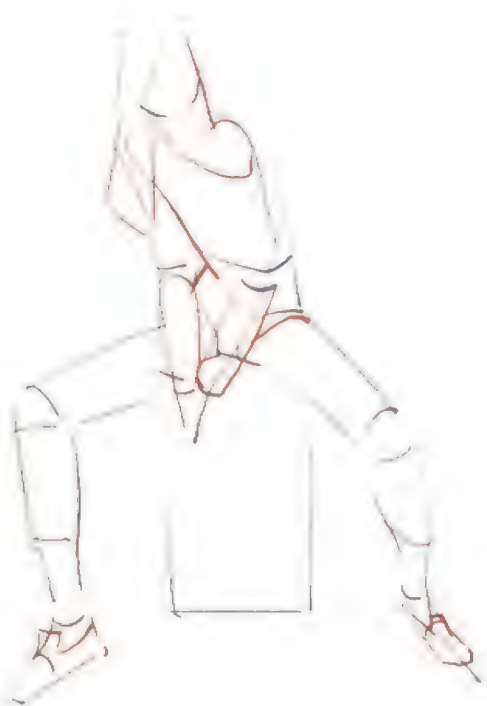
Neuroscience Letters 362 (2004) 105–108



09

Sketch of personality characters

When the understanding of shape reaches a certain level At this time, we can strengthen the shape when drawing regular sketches. The uniqueness, under the reasonable condition of the bracket, put the shape. The three-dimensional relationship is clearly expressed, which is the personality of our painting. Character sketches are of great help.



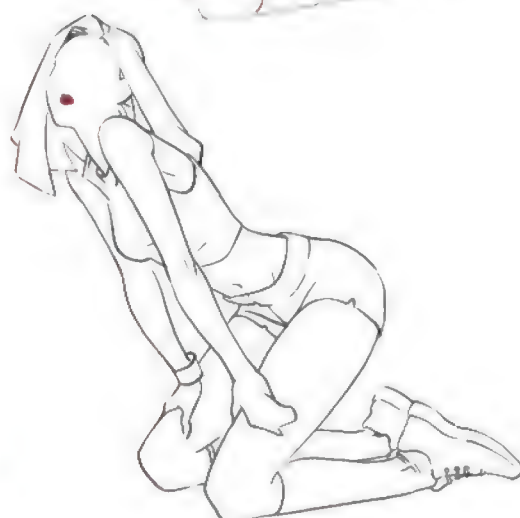
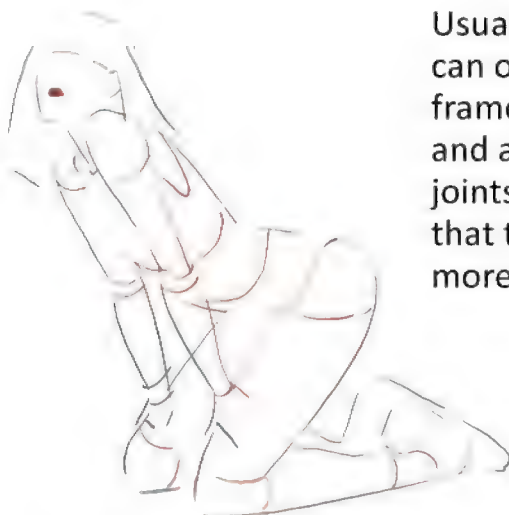
When we know enough about the human body structure, we can try to draw some sketches of individual characters in different styles.



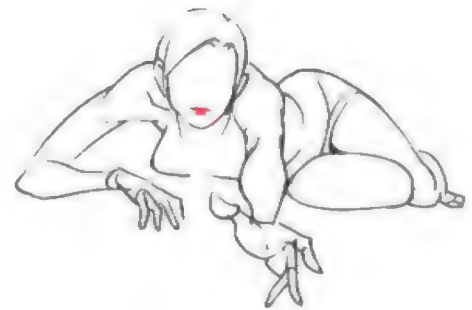
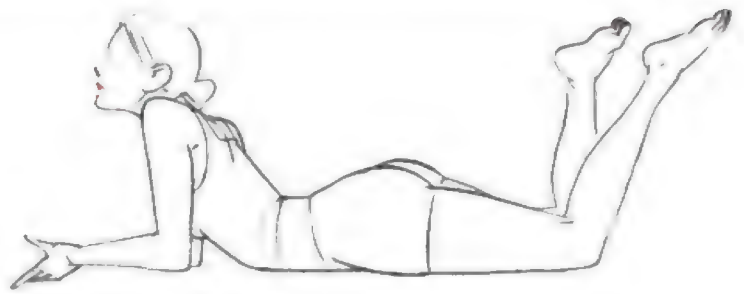
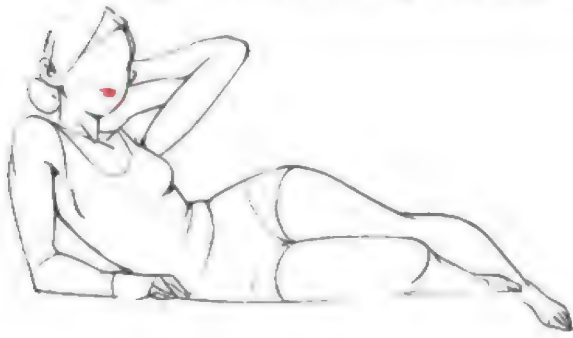
10

BODY FRAME OPTIMIZATION EXERCISES

Usually when sketching, we can optimize the human body frame, subjectively process and adjust the shape of the joints of the human body, so that the drawn characters are more reasonable.



When drawing skeletons of characters that are fat and generalized, we can optimize the human frame by weakening the depiction of muscles to make the drawn characters more natural.



Powerful body drawing exercises



Draw a plane shape, in the plane
Mark an arrow around the shape, This
arrow represents the human body in motion)
The main power direction of the time



Adjust the three that represent the torso

To ss of the three circles can

Enough to coordinate with the direction of power



Mark the shoulders on the basis of three circles

The sphere of the part is shown by lines

Three-dimensional head, chest cavity and abdomen

status.



Draw limbs on the basis of brackets
And its joints, and then identify
The arc direction of each joint point.

[illegible]

Body lines.



The above series of movements of waving weapons all reflect the sense of power of the human body.

We can try to draw a group of powerful sketches of the human body with reference to the above actions or with some specific actions as the theme.

12

Comprehensive drawing exercise of human body frame



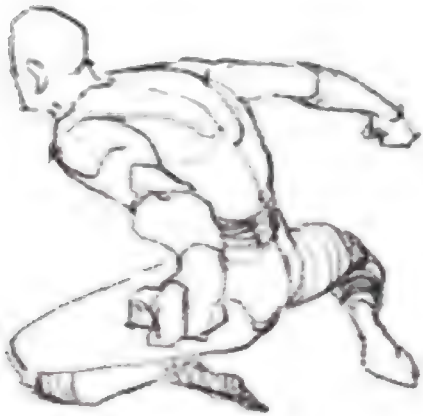
to draw different human movements silently more skillfully
State, we can try to draw a set of staggered lines at will ;
Stips, and then use each line as the spine of the human body
Then add the torso and limbs to draw different human bodies



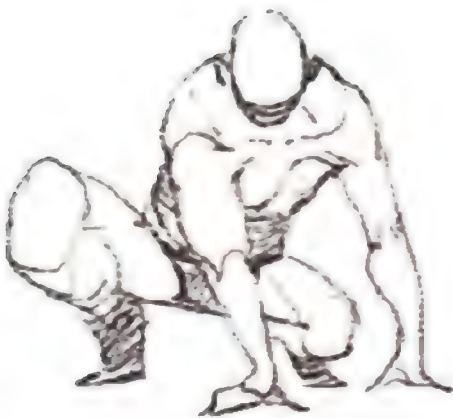
Different spine, screw stem, and limb states are
all Can show different human bodies in the same graphics
dynamic.



In order to better draw the human body bracket, we can draw a series of human bodies in motion by combining plane and three-dimensional







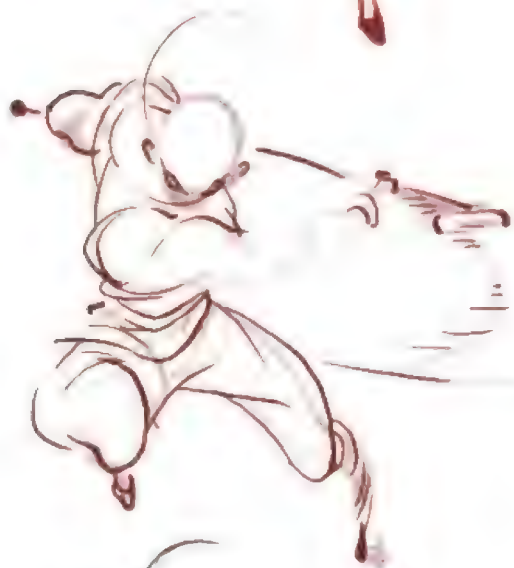
13

Ink painting human body dynamic drawing practice



In order to better express the tension of the picture, we
It can further shape the sense of power previously given to the system

— Lin Shaojun

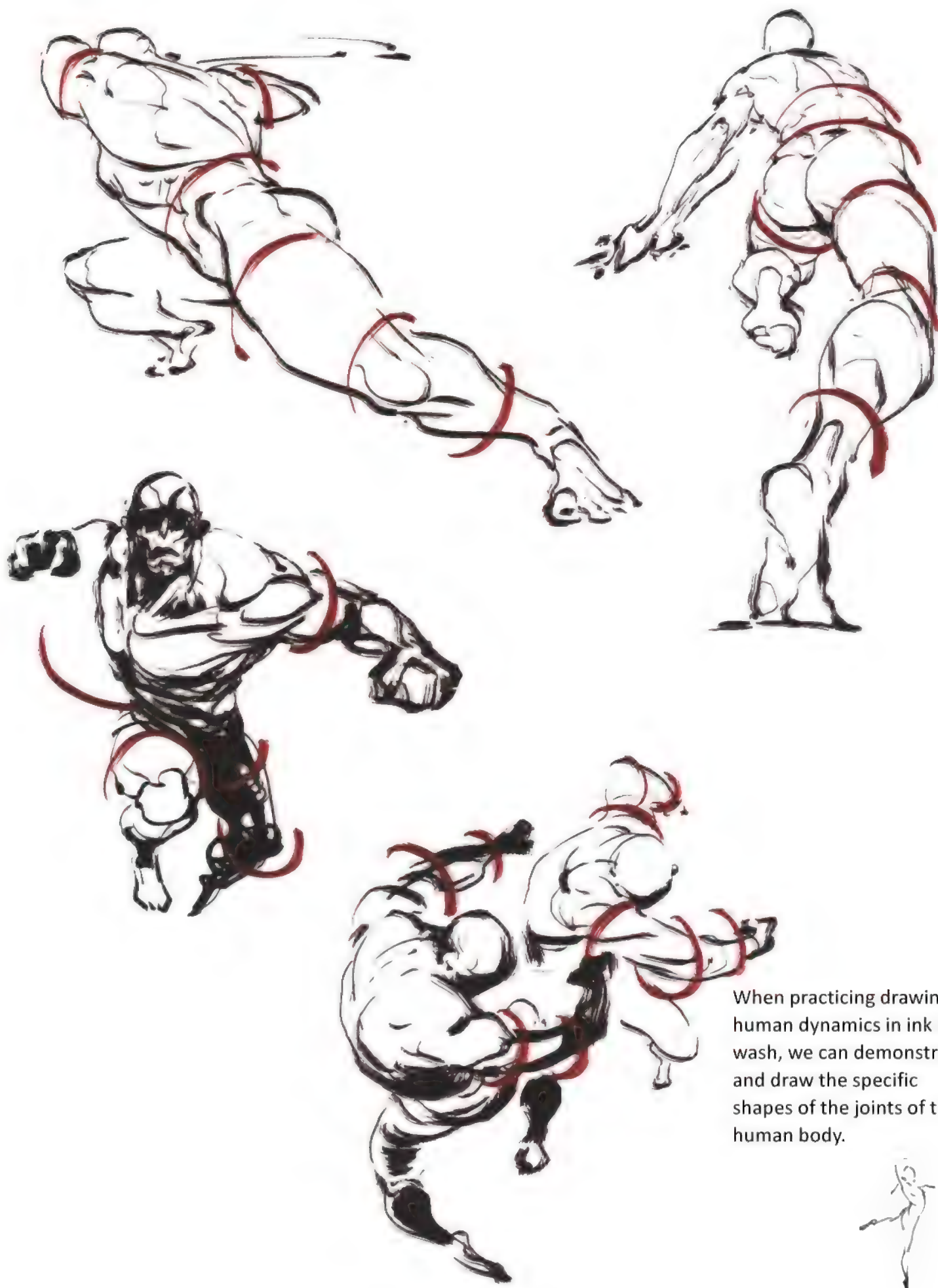


Use thinner lines to draw some tables on the items
Show the line of speed, and broadcast the clothes on the

— Lin Shaojun



Use some more textured brushes to focus on shaping
The direction of power, so that you can draw a more expressive
Ink human body dynamics



When practicing drawing human dynamics in ink and wash, we can demonstrate and draw the specific shapes of the joints of the human body.





After mastering the relevant knowledge of drawing water ink human body dynamics, we can try to draw some more complex water ink human body dynamics.



The movement state of the characters and the fluttering clothes are the key elements to portray the dynamics of the human body.





Chapter Seven

Feeling of work

第七章

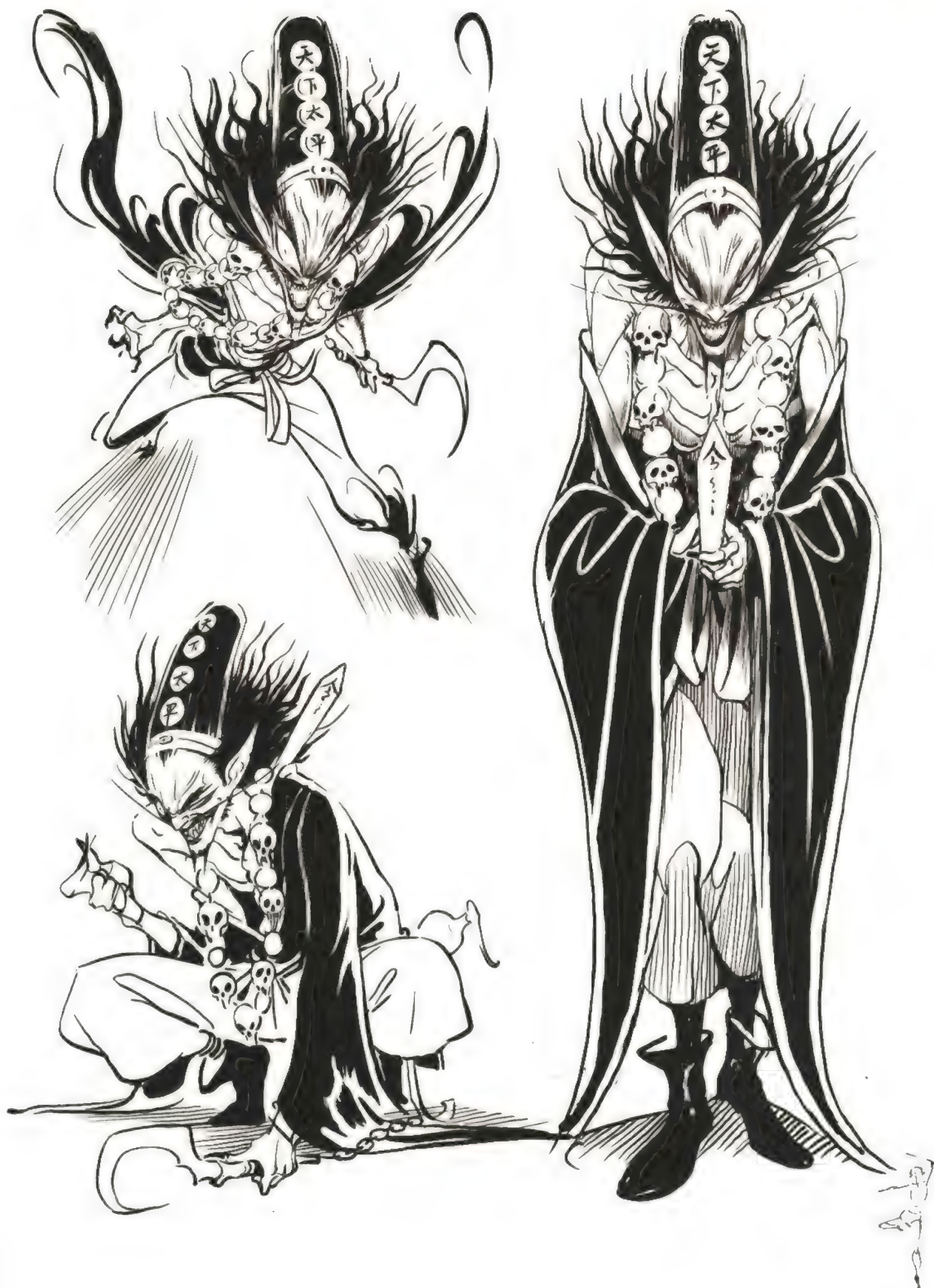
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01

Black impermanence









02

Knife-wielding ghost







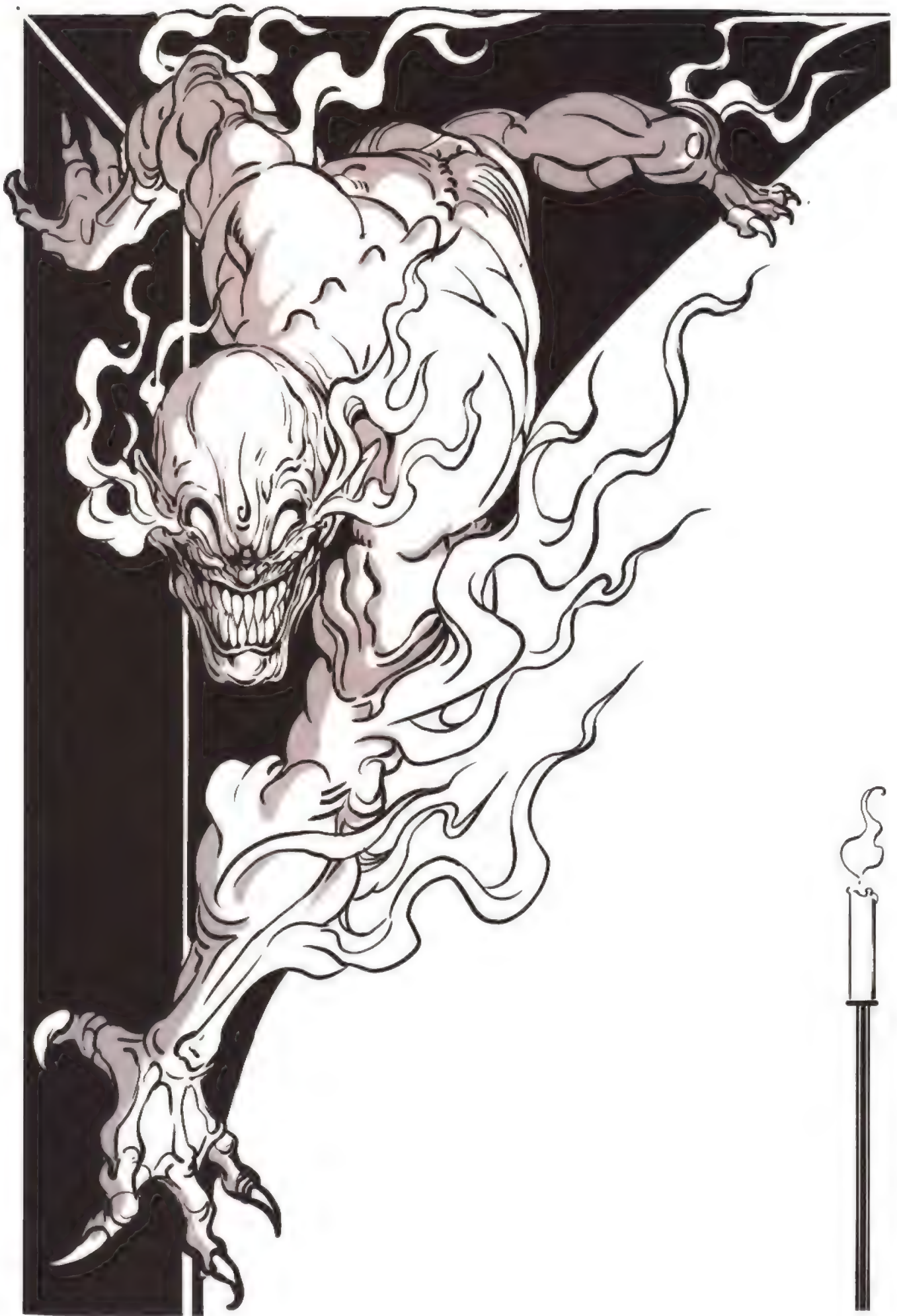


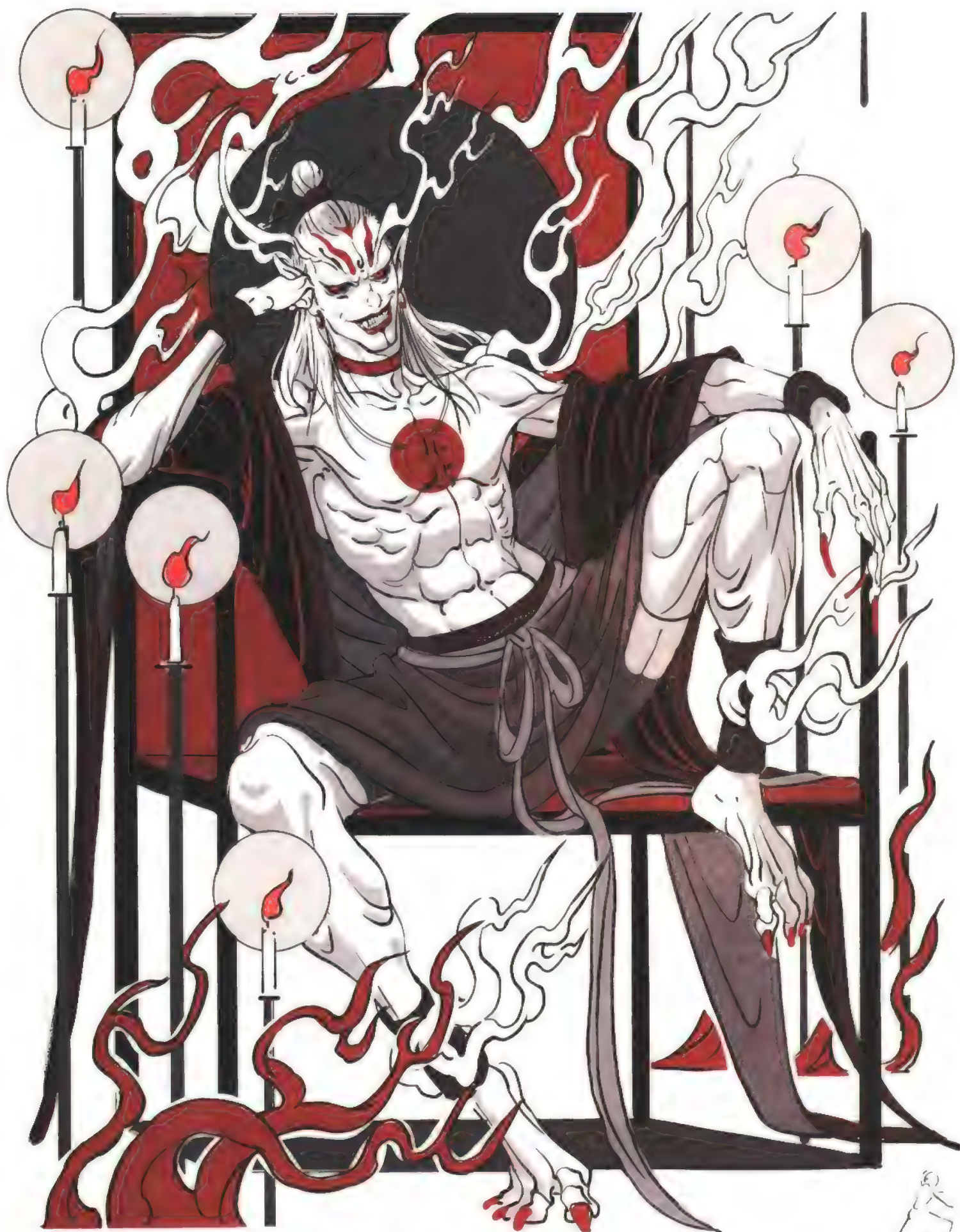
03

LANTERN GHOST













04

Vigorously Ghost King and Evil Ghost



The shaping of the belly part is inspired by what you see

The Vajra Arhat elephant

The strong ghost king of the second society



01

After identifying the proportions of the character, you can add muscles on the basis of them. In this step, the character is a very muscular, broad-shouldered, and thick-armed figure.

When adding muscles, there is no need to draw all the muscles, mainly to mark the movable joints.

The key to adjustment.



02

When adding muscles, there is no need to draw all the muscles, mainly to mark the movable joints.

When adding muscles, there is no need to draw all the muscles, mainly to mark the movable joints.

Logo: this can strengthen the dynamic sense of the character.



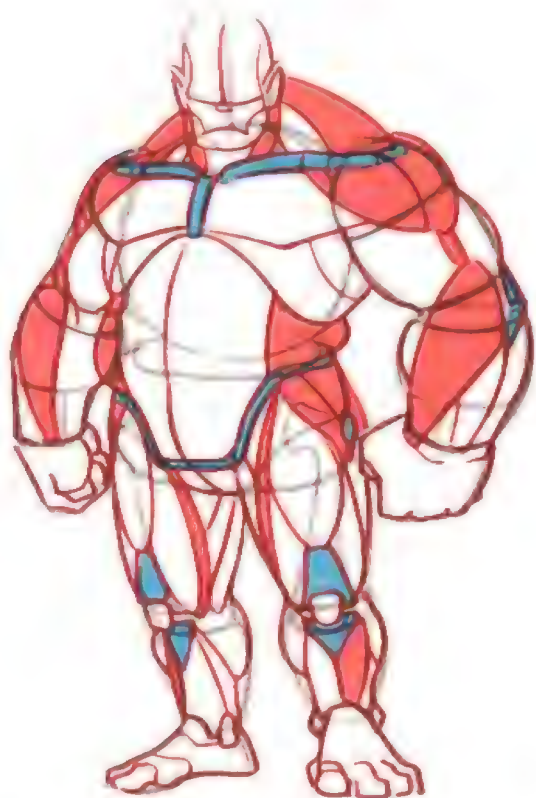
03

After identifying the proportions and bones of the characters, you can add muscles on the basis of them. In this step, the character is a very muscular, broad-shouldered, and thick-armed figure.

The shape of the muscles on it.

The above three steps are to build the foundation of a role, and only these basic relationships can be used. After the analysis is clear, the subsequent characterization will become easier.





04

With the structural foundation of the human body, you can add material details next. We will learn from the previous character modeling and analyze the way the character is dressed.



05

When drawing this step, don't rush into the details right away. Put the character's wear first. Arrange the areas and adjust the shape of these areas appropriately so that you can better control them. The overall relationship of this character.



06

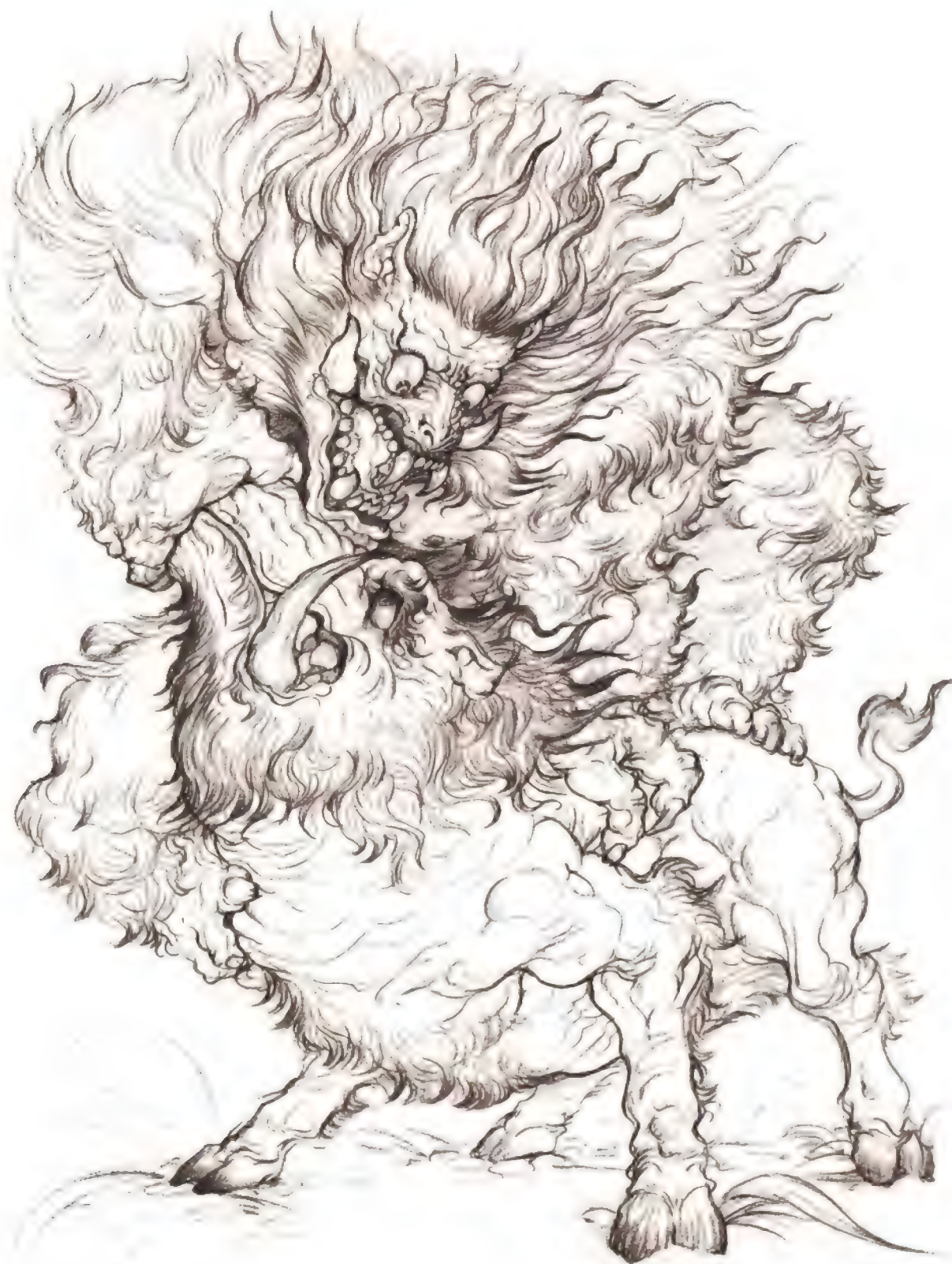
With an intuitive whole, then you can slowly shape the details of the character on the basis of it. Of course, this process requires everyone to have a certain amount of practice and accumulation to find their favorite way of portraying. So as to draw more interesting characters.





05

MANDRILL AND WILD BOAR



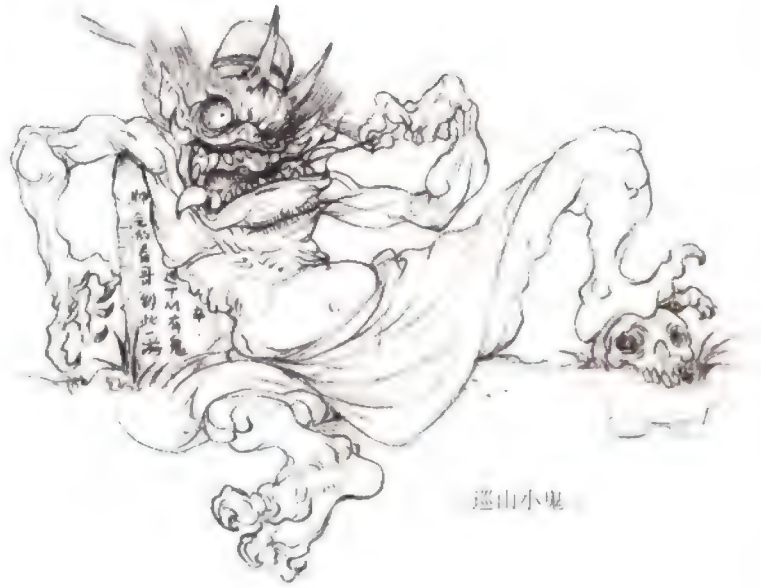
06

More monsters and ghosts





小鬼怪

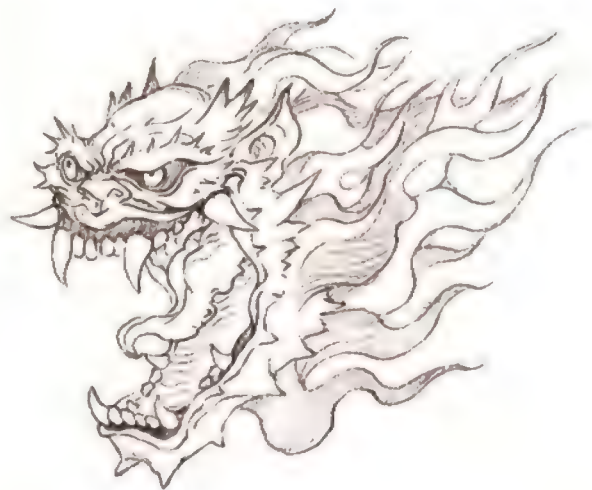
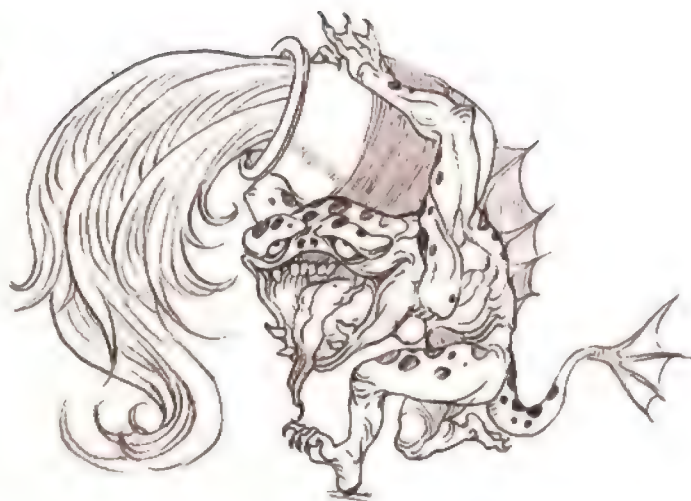


巡山小鬼



清静鬼









07

Character display



King Kong Lox





鬼将



九尾猫妖





吸血鬼



兽人







后记

这本书的创作积累，在我严重的拖延症的作用下，花了将近5年时间。

这期间我也经历了很多，兜兜转转，一路从广州到上海、北京，最后又重新回到广州。

这个过程是漫长和停驻的，有来自书稿的重压，有来自画画瓶颈期的迷惘，也有来自工作和家庭的压力。也经历过不想画的时刻，但始终还是拾笔埋头继续下去。至今还有很多自己没有摸清楚的东西，自知还相差甚远。

幸运的是，这一路走来遇到了很多厉害的前辈和有趣的小伙伴，他们每个人都有自己的绘画特质，能与大家交流让我感到无比温暖和愉悦。

感谢知名图书作者兼译者贵哥对本书提供的帮助。

感谢人民邮电出版社的专业编辑团队给予的支持和帮助。

感谢画画的春哥工作室教学团队小伙伴们的支持和陪伴，帮我分担了很多工作上的事务，让我有更足的精力可以专注创作。

感谢我的父母，感谢老爸和老妈一直以来对我的默默关怀和支持。

感谢多年来我任教的线上和线下绘画班所有的助教小伙伴、亲爱的同学们。一起画画和学习的日子是快乐而短暂的，十分幸运能够与你们相遇，愿大家学业有成，工作顺利，开心快乐。

最后仍然希望阅读本书的你可以从中得到一些收获，如果能有一定的进步将会是我莫大的荣幸。

坚持不懈的努力是灯塔上的微光，指引着你我前进的方向。

分类建议：绘画 / 动漫

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